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OFFICIAL GAZETTE

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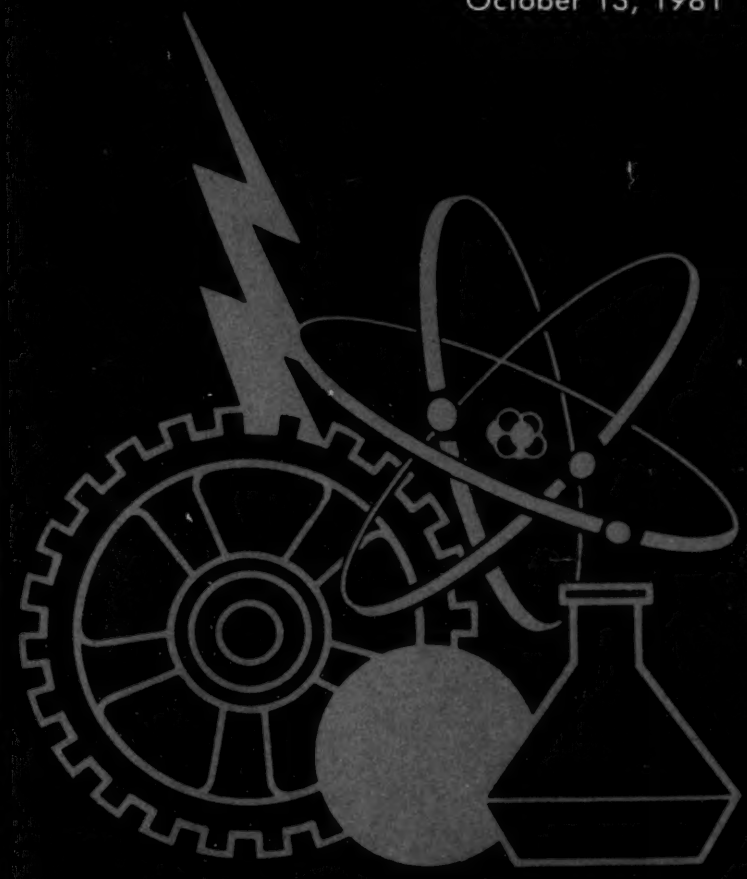
October 13, 1981



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 13, 1981 Volume 1011 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,693,629, Re. S.N. 272,615, Filed June 11, 1981, Cl. 131/5, LIGHTLY PRIZED TOBACCO, James A. Broughton, Owner of Record: *Brown & Williamson Tobacco Corp., Louisville, Ky.,* Attorney or Agent: Charles G. Lamb, Ex. Gp.: 335

4,109,750, Re. S.N. 266,715, Filed May 26, 1981, Cl. 181/224, ZENO DUCT SOUND ATTENUATING MEANS, Leslie S. Wirt, Owner of Record: *Lockhead Aircraft Corp., Burbank, Calif.,* Attorney or Agent: Frederic P. Smith, Ex. Gp.: 211

4,155,878, Re. S.N. 270,371, Filed June 4, 1981, Cl. 252/423, PROCESS FOR MAKING ACTIVATED CARBON WITH CONTROL OF METAL ION CONCENTRATION IN PHOSPHORIC ACID, Edward D. Tolles, et al., Owner of Record: *Westvaco Corp., New York, N.Y.,* Attorney or Agent: Richard L. Schmalz, et al., Ex. Gp.: 117

4,181,457, Re. S.N. 271,322, Filed June 8, 1981, Cl. 408/217, TAPPING TOOL FOR MAKING VIBRATION RESISTANT PREVAILING TORQUE FASTENER, Horace D. Holmes, Owner of Record: *Inventor,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 324

4,237,165, Re. S.N. 272,513, Filed June 11, 1981, Cl. 424/308, TREATMENT OF CARBOHYDRATE METABOLISH DISORDERS, Jacques Duhault, Owner of Record: *Science Union et cie Societe Francaise de Recherche Medicale, Suresnes, France,* Attorney or Agent: Gordon W. Hueschen, Ex. Gp.: 125

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,091,912, Reexam. No. 90/000,068, Requested: Sept. 9, 1981, Cl. 57/247, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, Nicholas J. Stoddard, et al., Owner of Record: *Lex Tex Ltd., Inc.,* Attorney or Agent: Howson & Howson, Ex. Gp.: 244, Requester: Glen Raven Mills, Inc., et al., c/o Cushman, Darby & Cushman, Washington, D.C.

3,449,567, Reexam. No. 90/000,065, Requested: Sept. 8, 1981, Cl. 250/362, APPARATUS AND PROCESS FOR DETERMINING PARTICLE SIZE BY X-RAY ABSORPTION ANALYSIS, James Peter Olivier, et al., Owner of Record: *Freeport Minerals Co.,* Attorney or Agent: Paul J. Luckern, Ex. Gp.: 252, Requester: Micromeritics Instrument Corp., Norcross, Ga.

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Official Gazettes of Feb. 24, 1981, May 26, 1981, Aug. 18, 1981, and Aug. 25, 1981, were assigned, prematurely, to published marks for which the opposition period had not yet run:

TMOG Feb. 24, 1981	TMOG May 26, 1981	TMOG Aug. 18, 1981	TMOG Aug. 25, 1981
1,147,842	1,155,713	1,165,412	1,166,062
		1,165,465	1,166,299
		1,165,588	1,166,392
		1,165,620	1,166,414
		1,165,738	1,166,454
			1,166,541
			1,166,687

Consequently, certificates of registration bearing the above-identified numbers were not issued on the dates indicated, and these registration numbers have been vacated.

Margaret Lawrence,
Sept. 15, 1981. *Assistant Commissioner for Trademarks.*

PATENT NOTICES

Certificates of Correction for the Week of Oct. 13, 1981

Re. 30,476	4,243,091	4,265,658	4,275,458
D. 259,815	4,243,584	4,265,817	4,275,688
D. 260,031	4,243,673	4,266,481	4,275,953
3,605,892	4,244,033	4,266,608	4,276,002
4,011,191	4,244,990	4,266,642	4,276,278
4,019,015	4,245,405	4,266,765	4,276,325
4,026,835	4,248,039	4,266,865	4,276,756
4,043,391	4,248,529	4,266,878	4,276,996
4,071,959	4,248,750	4,267,082	4,277,216
4,075,709	4,248,980	4,267,258	4,277,258
4,100,136	4,250,408	4,267,334	4,277,611
4,104,732	4,251,448	4,267,340	4,277,826
4,123,604	4,252,786	4,267,354	4,278,032
4,124,056	4,252,909	4,267,385	4,278,171
4,124,679	4,253,794	4,267,835	4,278,176
4,156,964	4,254,037	4,267,875	4,278,465
4,164,617	4,254,401	4,268,451	4,278,805
4,181,168	4,254,443	4,268,539	4,279,902
4,182,751	4,254,612	4,268,598	4,279,941
4,196,282	4,255,671	4,268,686	4,280,038
4,200,849	4,255,864	4,268,756	4,280,990
4,203,893	4,255,876	4,269,440	4,281,150
4,210,614	4,256,615	4,269,707	4,281,159
4,212,118	4,257,111	4,269,713	4,281,164
4,212,205	4,260,062	4,269,733	4,281,196
4,218,344	4,260,766	4,269,917	4,281,302
4,218,609	4,261,002	4,270,190	4,281,429
4,219,192	4,261,185	4,270,277	4,281,554
4,226,547	4,261,848	4,271,426	4,281,760
4,230,430	4,261,866	4,271,466	4,281,971
4,230,611	4,262,232	4,272,209	4,282,393
4,230,696	4,262,282	4,272,698	4,282,566
4,231,676	4,262,341	4,273,435	4,282,601
4,232,034	4,264,344	4,273,586	4,282,618
4,235,709	4,264,439	4,274,071	4,282,658
4,237,068	4,264,610	4,274,297	4,283,146
4,237,443	4,264,921	4,274,852	4,283,311
4,239,298	4,264,933	4,275,376	4,283,453
4,242,150	4,265,633	4,275,438	4,284,942

Disclaimers

Re. 28,682.—*Charles E. Hoey,* Marlton, N.J. DECORATIVE LAMINATE. Patent dated Jan. 13, 1976. Disclaimer filed May 29, 1981, by the assignee, *Rohm & Haas Co.*

Hereby enters this disclaimer to all claims of said patent.

3,163,645.—*George de Stevens* and *Lincoln Harvey Werner,* Summit, N. J. DERIVATIVES OF 3,4-DIHYDRO-2-H-[1,2,4]-BENZOTHIADIAZINE-1, 1-DIOXIDES. Patent dated Dec. 29, 1964. Disclaimer filed June 29, 1981, by the the assignee, *Ciba-Geigy Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,068,488.—*D. Graham Ball,* North Vancouver, Canada. METHOD OF BACKFILLING PIPELINE TRENCHES. Patent dated Jan. 17, 1978. Disclaimer filed July 31, 1981, by the assignee, *Rader Companies, Inc.*

Hereby enters this disclaimer to claims 3 and 6 of said patent.

4,166,415.—*Edwin A. Spanke,* Oak Forest and *Louis F. Carrieri,* La Grange Park, Ill. PRESS HAVING OVERLOAD RESPONSIVE SLIDE SHUT HEIGHT ADJUSTING MECHANISM. Patent dated Sept. 4, 1979. Disclaimer filed July 6, 1981, by the assignee, *Gulf & Western Manufacturing Co.*

Hereby enters this disclaimer to claims 1 and 5 of said patent.

4,204,212.—*Arthur R. Sindoris,* Cary, N.C., *Frederick G. Farrar,* Kensington, and *Daniel H. Schaubert,* Silver Spring, Md. CONFORMAL SPIRAL ANTENNA. Patent dated May 20, 1980. Disclaimer filed Aug. 11, 1981, by the assignee, *The United States of America as represented by the Secretary of the Army.*

Hereby enters this disclaimer to claims 1–2 and 4–5 of said patent.

4,272,980.—*Louis F. Carrieri,* La Grange Park, IL. LOAD EQUALIZER FOR PRESS TOOLING. Patent dated June 16, 1981. Disclaimer filed July 6, 1981, by the assignee, *Gulf & Western Manufacturing Co.*

Hereby enters this disclaimer to claims 1, 3, 8 and 17 of said patent.

Dedications

3,291,947.—*Roswell C. Van Sickle,* Wilkinsburg, Pa. INTERRUPTING STRUCTURES FOR COMPRESSED-GAS CIRCUIT INTERRUPTERS HAVING DOUBLE-BREAK HOLLOW ROTATIVE MOVING CONTACT-ARM ASSEMBLY. Patent dated Dec. 13, 1966. Dedication filed July 20, 1981, by the assignee, *Westinghouse Electric Corp.*

Hereby didicates to the Public the remaining term of said patent.

4,270,640.—*David A. Davies,* Leamington SPA, United Kingdom. FRICTION CLUTCH DRIVEN PLATES. Patent dated June 2, 1981. Dedication filed Aug. 31, 1981, by the assignee, *Automative Products Ltd.*

Hereby dedicates to the public the remaining portion of the term of said patent.

Patents Available for License or Sale

3,748,898. METHOD AND APPARATUS RELATED TO THE TESTING OF HYDRAULIC CIRCUITS. *Neil F. Greenblum, Esq. Sandler & Greenblum,* 1717 K St., N. W., Suite 1101, Washington, D.C. 20006 202-659-0035.

3,961,865. CONVERSION BRACKET FOR WELL PUMP. *Vernon E. Spaulding,* 7021 Grade La., Louisville, Ky. 40213.

4,031,862. ECONOMIZER. *Richard D. Weber, Synnestvedt & Lechner,* 3131 PSFS Bldg. 12, South 12th St., Philadelphia, Pa. 19107.

4,136,764. MOTHER ALICE'S BREAD VENDING MACHINE. *Alice Johnson,* 8650 Belford Ave. #11, Los Angeles, Calif. 90045 or Attorney Bernard Kleinke, (312) 332-6930.

4,209,539. DETOXIFICATION OF BOTANICAL FOODSTUFFS. *Thomas F. Banigan and Anthony J. Verbiscar,* Anver Bioscience Design, Inc., 160 E. Montecito Ave., Sierra Madre, Calif. 91024.

4,222,371. SOLAR ENERGY COLLECTOR. *George F. Heath,* 1655 Richard Ave. Sanger, Calif. 92657.

4,225,052. INSULATED FOOD CONTAINER. *Nancie Tector.* Correspondence to: Wagner & Aubel, 135 S. La Salle St., Chicago, Ill., 60603.

4,275,536. WALL ELEMENT FOR A CONSTRUCTION WALL. *Karl H. Vahlbrauk,* Kriegerweg 1, D-3353 Bad Gandersheim, Federal Republic of Germany, Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,275,975. MINE ROOF ANCHOR SYSTEM. *Bennie E. Morgan,* Roof Control, Inc., 411 E. Main St., Morganfield, Ky. 42437

4,270,123. DETECTOR FOR INDICATING A FIRE OR DETECTOR MALFUNCTION. *Neil F. Greenblum, Esq. Sandler & Greenblum,* 1717 K St., N. W. Suite 1101, Washington, D.C. 20006 202-659-0035.

4,231,061. INSTANT COLOR SLIDE RECORDER OF CRT IMAGE. *Samuel Freeman,* 13 Birchwood Ct. East, Syosset, N.Y. 11791.

Otis Engineering Corp. is prepared to grant licenses under the following patents upon reasonable terms. Address inquires to: Patent Attorney, Otis Engineering Corp., P.O. Box 34380, Dallas, Tex. 75234, Telephone (214) 323-3882.

4,117,563. THREAD CHASER TOOL FOR CONTIGUOUS STRAIGHT AND TAPERED THREAD RUNS.

4,234,167. AUTOMATIC INHAUL WINCH SYSTEM.

General Electric Co. is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: Patent Counsel, Industrial and Marine Steam Turbine Division, General Electric Co., 1100 Western Ave., Lynn, Ma. 01910.

3,651,662. GEAR TYPE FLEXIBLE COUPLING.

Application for license may be addressed to: Patent Counsel, Mobile Radio Products Department, Mobile Communications Business Division, General Electric Co., Mountain View, Lunchburh, Va. 24502.

4,259,596. CHARGE TRANSFER SIGNAL PROCESSING APPARATUS FILTER.

4,259,597. CHARGE TRANSFER SIGNAL PROCESSING APPARATUS FILTER.

4,259,598. CHARGE TRANSFER SIGNAL PROCESSING APPARATUS TRANSVERSAL FILTER.

Application for license may be addressed to the General Electric Co., Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,229,811. INTRUSION DETECTION METHOD AND APPARATUS.

Applications for license may be addressed to: Patent Counsel, Mobile Radio Products Department, Mobile Communications Business Division, General Electric Co., Mountain View Rd., Lynchburg, Va. 24502.

4,281,413. MULTICHANNEL RADIO TELEPHONE SYSTEM.

Applications for license under the following patent should be addressed to: Mr. Arnold E. Renner, Division Patent Counsel, Industrial Electronics Systems Division General Electric Co., 1501 Roanoke Blvd., Salem, Va. 24153

4,257,000. APPARATUS FOR CONTROLLING THE LENGTH OF MOVEMENT OF A CONTROLLED MEMBER ALONG A PATH OF REPEATED OPERATING POSITIONS.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Co., 1 River Rd., Bldg. 500, Room 218, Schenectady, N.Y. 12345.

4,275,559. RETRACTABLE IGNITIER DEVICE FOR GAS TURBINES.

4,277,832. FLUID FLOW CONTROL SYSTEM.

Applicants for license may be addressed to: Patent Counsel, Transportation Systems., Business Division, General Electric Co., 2901 E. Lake Rd., Erie, Pa. 16531.

4,207,778. REINFORCED CROSS PLY COMPOSITE FLYWHEEL AND METHOD FOR MAKING SAME.

4,244,017. THIRD HARMONIC AUXILIARY COMMUTATED INVERTER HAVING SELECTABLE COMMUTATION CAPACITANCE AS A FUNCTION OF LOAD CURRENT.

4,258,302. APPARATUS FOR MAINTAINING SYNCHRONOUS MACHINE DRIVE SYSTEM AT LIGHT OF ZERO MACHINE LOADS.

Application for license may be addressed to the General Electric Co., Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

D-210,895. DESIGN FOR CLOCK OR SIMILAR ARTICLE.

D-217,928. DESIGN FOR FLOOR POLISHER DISPENSER.

D-255,571. DESIGN FOR CITIZEN'S BAND RADIO OR SIMILAR ARTICLE.

D-255,572. DESIGN FOR A CLOCK RADIO OR SIMILAR ARTICLE.

D-248,468. DESIGN FOR CASSETTE TAPE RECORDER.

D-248,754. DESIGN FOR COMBINED CASSETTE TAPE RECORDER AND RADIO.

D-249,865. DESIGN FOR PORTABLE RADIO.

D-250,191. DESIGN FOR PORTABLE RADIO.

D-251,555. DESIGN FOR RADIO AND TAPE PLAYER OR SIMILAR ARTICLE.

D-251,782. DESIGN FOR TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE.

D-251,841. DESIGN FOR CARTRIDGE TAPE PLAYER OR SIMILAR ARTICLE.

D-253,107. DESIGN FOR TAPE PLAYER OR SIMILAR ARTICLE.

D-255,444. DESIGN FOR COMBINED TAPE RECORDER AND PLAYER OR SIMILAR ARTICLE.

4,065,658. ELECTRIC TOASTER CONTROL.

4,166,994. THEROMSTAT WITH POSITIVE OFF POSITION.

4,220,134. TOASTER/OVEN ACCESSORY CONTAINER.

4,278,873. TEMPERATURE-RESPONSIVE CONTROL MEANS.

D-256,013. DESIGN FOR COMBINED CASSETTE TAPE PLAYER AND RADIO.

D-256,122. DESIGN FOR COMBINED RADIO AND WALKIE TALKIE OR SIMILAR ARTICLE.

D-256,123. DESIGN FOR CLOCK RADIO OR SIMILAR ARTICLE.

3,805,375. COMPOSITE INTEGRATED CIRCUITS INCLUDING SEMICONDUC-

TOR CHIPS MOUNTED ON A COMMON SUBSTRATE WITH CONNECTIONS MADE THROUGH A DIELECTRIC ENCAPSULATOR.

3,816,196. PASSIVATION OF PHOTORESIST MATERIALS USED IN SELECTIVE PLASMA ETCHING.

3,816,198. SELECTIVE PLASMA ETCHING OF ORGANIC MATERIALS EMPLOYING PHOTOLITHOGRAPHIC TECHNIQUES.

3,835,397. DIGITALLY CONTROLLED PHASE SHIFT NETWORK.

3,840,293. ELECTRONICALLY DRIVEN SPIRAL SCAN SYNCHRONOUS TRANSMIT-RECEIVER LASER SYSTEM.

3,840,827. DIODE PHASE SHIFTING NETWORK.

3,853,496. METHOD OF MAKING A METAL INSULATOR SILICON FIELD EFFECT TRANSISTOR (MIS-FET) MEMORY DEVICE AND THE PRODUCT.

3,856,406. HETERODYNE LASER ABSORPTION SPECTROMETER.

3,860,399. LIQUID BLOCKING TECHNIQUE FOR WORKING A MEMBER TO PRECISE OPTICAL TOLERANCES.

3,870,414. METHOD OF SENSING SURFACE DISPLACEMENT ORTHOGONAL TO THE DIRECTION OF OBSERVATION.

3,874,796. METHOD OF SURFACE CONTOURING.

3,879,988. OPTICAL COMPARATOR FOR MEASURING VIBRATION ON A ROTATING OBJECT.

3,904,925. POWER SUPPLY FOR A THERMIONIC EMISSION GAS DISCHARGE LAMP.

3,914,590. SERIAL TWO'S COMPLEMENTER.

3,919,558. HOT SUB-STAGE FOR A SCANNING ELECTRON MICROSCOPE.

3,920,951. LASER ETCHING APPARATUS FOR FORMING PHOTOGRAPHIC IMAGES ON METALLIC SURFACES.

Applications for licenses may be addressed to the Patent Counsel, Electronics Laboratory, General Electric Co., Electronics Park, Bldg. 2, Room 205, Syracuse, N.Y. 13221.

3,493,073. ACOUSTIC HOLOGRAPHIC APPARATUS WITH VISUAL DISPLAY.

3,558,974. LIGHT EMITTING DIODE ARRAY STRUCTURE.

3,559,091. BROADBAND INTERSTAGE COUPLING CIRCUIT.

3,594,795. RADAR SYSTEM.

3,599,104. LOGARITHMIC AMPLIFIER OF EXTENDED DYNAMIC RANGE.

3,614,404. ELECTRONIC CALCULATOR.

3,614,748. HIGH-SPEED MEMORY AND MULTIPLE LEVEL LOGIC NETWORK WITH PULSE SHAPING.

3,615,946. METHOD OF EMBEDDING SEMICONDUCTOR CHIP WITHIN A DIELECTRIC LAYER FLUSH WITH SURFACE.

3,621,354. DC MOTOR CURRENT ACTUATED DIGITAL CONTROL SYSTEM.

3,652,162. COMPLEX DATA PROCESSING SYSTEM EMPLOYING INCOHERENT OPTICS.

3,654,563. ACTIVE FILTER CIRCUIT HAVING NONLINEAR PROPERTIES.

3,655,371. METHOD AND APPARATUS FOR REPRODUCING OPTICAL INFORMATION.

3,679,941. COMPOSITE INTEGRATED CIRCUITS INCLUDING SEMICONDUCTOR CHIPS MOUNTED ON A COMMON SUBSTRATE WITH CONNECTIONS MADE THROUGH A DIELECTRIC ENCAPSULATOR.

3,691,628. METHOD OF FABRICATING COMPOSITE INEGRATED CIRCUITS.

3,710,267. ENVELOPE RATE DEMODULATOR.

3,737,743. HIGH POWER MICROWAVE FIELD EFFECT TRANSISTOR.

3,757,175. COMPOSITE INTEGRATED CIRCUITS WITH COPLANAR CONNECTIONS TO SEMICONDUCTOR CHIPS MOUNTED ON A SINGLE SUBSTRATE.

3,767,308. METHOD AND APPARATUS FOR SENSING SURFACE DISPLACEMENT ORTHOGONAL TO THE LINE OF SIGHT.

3,782,176. APPARATUS FOR MEASURING VIBRATION IN A MOVING OBJECT.

Application for license may be addressed to: General Electric Co., Component Motor Division, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801, Attention: Patent Counsel.

3,261,992. ELECTRICAL LOAD BALANCING CONTROL SYSTEM.

3,881,238. APPARATUS FOR WINDING MAGNETIC CORES AND TREATING LEADS.

3,887,677. PROCESS OF MAKING A DYNAMOELECTRIC MACHINE STRUCTURE BY PRESSURE MOLDING.

4,107,583. DYNAMOELECTRIC MACHINE WINDING ARRANGEMENTS, DYNAMOELECTRIC MACHINES INCORPORATING SAME AND METHODS OF OPERATING SUCH DYNAMOELECTRIC MACHINES.

4,116,410. ADAPTABLE RESILIENT MOTOR MOUNTING.

4,243,967. THERMOSTAT AND METHOD OF OPERATING.

Applications for license may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky. 40225.

3,640,264. COMBUSTOR MEANS FOR PRESSURIZED GAS-FIRED SPACE HEATER.

3,667,451. GAS-FIRED HEATER MEANS.

3,667,892. CONTROL MEANS FOR PRESSURIZED GAS-FIRED SPACE HEATER.

3,670,713. GAS-FIRED HEATER MEANS.

3,850,496. CONNECTOR BLOCK FOR HERMETIC MOTOR COMPRESSOR.

3,995,349. DOOR HANDLE OF A HOUSEHOLD REFRIGERATOR.

4,009,589. SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS AND METHOD OF ADJUSTMENT.

4,009,590. SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS.

4,009,591. SINGLE EVAPORATOR, SINGLE FAN COMBINATION REFRIGERATOR WITH INDEPENDENT TEMPERATURE CONTROLS.

4,031,715. FLEXIBLE COUPLING ASSEMBLY.

4,084,291. CENTER HINGE FOR TOP-MOUNT TWO DOOR REFRIGERATOR.

4,096,430. METAL-OXIDE-SEMICONDUCTOR VOLTAGE REFERENCE.

4,121,204. BAR GRAPH TYPE TOUCH SWITCH AND DISPLAY DEVICE.

4,138,859. SPLIT HEAT PUMP OUTDOOR FAN ARRANGEMENT.

4,156,350. REFRIGERATION APPARATUS DEMAND DEFROST CONTROL SYSTEM AND METHOD.

4,156,352. COOLING ARRANGEMENT FOR A REFRIGERATOR MACHINERY.

4,157,042. PULLEY DRIVE SYSTEM.

4,256,951. REPETITION RATE POWER CONTROL FOR APPLIANCE USING HIGH CURRENT INRUSH ELEMENTS.

4,261,182. AUTOMATIC ICEMAKER INCLUDING MEANS FOR MINIMIZING THE SUPERCOOLING EFFECT.

4,262,183. COMBINATION MICROWAVE/FORCED CONVECTION OVEN.

4,263,646. MISSED COMMUTATION DETECTOR AND SAFEGUARD ARRANGEMENT.

4,265,089. ICE MAKING APPARATUS AND METHOD.

4,269,035. DEFROST CONTROL.

4,271,861. DISHWASHER FILL LEVEL CONTROL ARRANGEMENT.

4,271,899. HEAT PUMP CONTROL SYSTEM.

4,207,778. REINFORCED CROSS PLY COMPOSITE FLYWHEEL AND METHOD FOR MAKING SAME.

4,244,017. THIRD HARMONIC AUXILIARY COMMUTATED INVERTER HAVING SELECTABLE COMMUTATION CAPACITANCE AS A FUNCTION OF LOAD CURRENT.

4,258,302. APPARATUS FOR MAINTAINING SYNCHRONOUS MACHINE DRIVE SYSTEM AT LIGHT OF ZERO MACHINE LOADS.

4,275,388. PIEZOELECTRIC AUDIBLE ALARM FREQUENCY SELF-CALIBRATION SYSTEM.

Application for license may be addressed to the General Electric Co., Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

4,138,606. COOKING APPLIANCE.

4,140,048. TOAST LOAD SELECTOR MECHANISM.

4,216,763. TOASTER/OVEN ACCESSORY PAN WITH HANDLE.

4,278,873. TEMPERATURE RESPONSIVE CONTROL MEANS.

D-235,267. DESIGN FOR EIGHT-TRACK PORTABLE TAPE PLAYER.

D-255,881. DESIGN FOR PORTABLE CASSETTE TAPE RECORDER.

D-236,902. DESIGN FOR PORTABLE CASSETTE TAPE RECORDER WITH AM/FM RECEIVER.

D-254,489. CASSETTE TAPE RECORDER OR SIMILAR ARTICLE.

The RCA Corp. offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corp., Sr. Vice President, Licensing 30 Rockefeller Plz., New York, N.Y. 10020.

4,271,129. HEAT RADIATION DEFLECTORS WITHIN AN EFG CRUCIBLE.

4,271,247. COLOR PICTURE TUBE WITH SCREEN HAVING LIGHT ABSORBING AREAS.

4,271,377. SYSTEM FOR COMPENSATING FOR CATHODE VARIATIONS IN DISPLAY DEVICES UTILIZING LINE CATHODES.

4,271,394. AMPLIFIER CIRCUIT.

4,271,422. CMOS SOS WITH NARROW RING SHAPED P SILICON GATE COMMON TO BOTH DEVICES.

4,271,433. SAW FILTER PREAMPLIFIER.

4,271,489. OPTICAL DISC PLAYER SYSTEM.

4,271,532. RECEIVER WITH A CHANNEL SWAPPING APPARATUS.

4,272,045. NUTATION DAMPING IN A DUAL-SPIN SPACECRAFT.

4,272,083. VIDEO DISC PLAYER HAVING RECORD EXTRACTING MECHANISM.

4,272,197. APPARATUS AND METHOD FOR MEASURING THE RATIO OF TWO SIGNALS.

4,272,641. TANDEM JUNCTION AMORPHOUS SILICON SOLAR CELLS.

4,272,726. DIFFERENTIAL FM DETECTOR WITH SERIES TUNED FILTER.

4,272,728. DIFFERENTIAL-INPUT AMPLIFIER CIRCUIT.

4,272,743. METHOD FOR TUNING A FILTER CIRCUIT.

4,272,777. SERVICE SWITCH APPARATUS.

4,272,778. COLOR-DIFFERENCE SIGNAL PROCESSING CIRCUITS.

4,272,785. DEFECT COMPENSATION FOR COLOR TELEVISION.

4,272,786. VIDEO DISC PLAYBACK APPARATUS WITH NON-LINEAR APERTURE CORRECTION.

4,272,881. METHOD FOR MAKING A CLOSED GATE MOS TRANSISTOR WITH SELF-ALIGNED CONTACTS WITH DUAL PASSIVATION LAYER.

4,272,882. METHOD OF LAYING OUT AN INTEGRATED CIRCUIT WITH SPECIFIC ALIGNMENT OF THE COLLECTOR CONTACT WITH THE EMITTER REGION.

4,273,342. PROTECTIVE CARTRIDGE FOR OPTICAL DISCS.

4,273,805. PASSIVATING COMPOSITE FOR A SEMICONDUCTOR DEVICE COMPRISING A SILICON NITRIDE (SI3N4) LAYER AND PHOSPHOSILICATE GLASS (PSG) LAYER.

4,273,822. GLAZING PASTE FOR BONDING A METAL LAYER TO A CERAMIC SUBSTRATE.

4,273,828. BULK GLASS HAVING IMPROVED PROPERTIES.

4,274,014. SWITCHED CURRENT SOURCE FOR CURRENT LIMITING COMPLEMENTARY SYMMETRY INVERTER.

4,276,688. METHOD FOR FORMING BURIED CONTACT COMPLEMENTARY MOS DEVICES.

4,277,695. AMPLIFIER HAVING DEAD ZONE OF CONTROLLABLE WIDTH AND POSITION.

4,277,729. SIMPLIFIED VERTICAL DEFLECTION CIRCUIT.

4,277,793. PHOTODIODE HAVING ENHANCED LONG WAVELENGTH RESPONSE.

4,277,796. SLOW DOWN COLOR PROCESSOR FOR VIDEO DISC MASTERING USING A SPECIAL MODE VIR.

4,277,798. AUTOMATIC KINESCOPE BIASING SYSTEM WITH INCREASED INTERFERENCE IMMUNITY.

4,277,801. COLOR FILTER HAVING VERTICAL COLOR STRIPES WITH A NONINTEGRAL RELATIONSHIP TO CCD PHOTOSENSORS.

4,277,884. METHOD FOR FORMING AN IMPROVED GATE MEMBER UTILIZING SPECIAL MASKING AND OXIDIATION TO ELIMINATE PROJECTING POINTS ON SILICON ISLANDS.

4,278,508. METHOD OF DETECTING A CATHODIC CORROSION SITE ON A METALLIZED SUBSTRATE.

4,278,704. METHOD FOR FORMING AN ELECTRICAL CONTACT TO A SOLAR CELL.

4,278,846. VIDEO DISC LOCKED GROOVE CLEARANCE SYSTEM.

4,278,946. CURRENT SCALING CIRCUITRY.

4,278,977. RANGE DETERMINING SYSTEM.

4,278,992. PCM DETECTOR FOR VIDEO REPRODUCER APPARATUS.

4,279,073. METHOD FOR RELEASING PRINTED WIRING BOARDS FROM PRINTED WIRING BOARD RACKS.

4,279,688. METHOD OF IMPROVING SILICON CRYSTAL PERFECTION IN SILICON ON SAPPHIRE DEVICES.

4,280,023. STYLUS POSITION SENSING APPARATUS FOR VIDEO DISC PLAYER.

4,280,024. SELECTIVELY DAMPED VIDEO DISC STYLUS ASSEMBLY.

4,280,077. CATHODE-RAY TUBE HAVING CORRUGATED SHADOW MASK WITH VARYING WAVEFORM.

4,280,191. QUANTIZING CIRCUITS.

4,280,674. BALLOON WITH DEFLATION PORT.

4,280,941. VIDEO DISCS AND MOLDING COMPOSITIONS THEREFOR.

4,281,270. PRECOATED RESISTIVE LENS STRUCTURE FOR ELECTRON GUN AND METHOD OF FABRICATION.

4,281,278. REDUNDANT BATTERY PROTECTION SYSTEM.

4,281,349. POWER SUPPLY ARRANGEMENT FOR A TUNING SYSTEM.

4,281,349. POWER SUPPLY ARRANGEMENTFIELD-EFFECT TRANSISTOR (IGFET) ON A SIGNAL SOURCE.

4,281,407. SURFACE ACOUSTIC WAVE PICK-UP AND RECORDING DEVICE.

4,274,193. METHOD FOR MAKING A CLOSED GATE MOS TRANSISTOR WITH SELF-ALIGNED CONTACTS.

4,274,294. APPARATUS FOR CONVERTING ROTARY MOTION TO LINEAR MOTION.

4,275,100. VIDEO DISC PROCESSING.

4,275,101. VIDEO DISC LUBRICANTS.

4,275,282. CENTERING SUPPORT FOR A ROTABLE WAFER SUPPORT SUSCEPTOR.

4,275,316. RESETTABLE BISTABLE CIRCUIT.

4,275,347. PRECISION CATHODE CURRENT REGULATOR.

4,275,362. GAIN CONTROLLED AMPLIFIER USING A PIN DIODE.

4,275,366. PHASE SHIFTER.

4,275,416. PCM DETECTOR.

4,275,861. ORIENTATION OF MOMENTUM STABILIZED VEHICLES.

4,276,566. CIRCUIT FOR INHIBITING RADIO FREQUENCY INTERFERENCE IN A TELEVISION RECEIVER.

4,276,592. A-C RECTIFIER CIRCUIT FOR POWERING MONOLITHIC INTEGRATED CIRCUITS.

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
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Illinois	Chicago Public Library	(312) 269-2814
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New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 5, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-12-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	7-09-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	1-12-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	5-06-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	1-07-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-18-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-23-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-20-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	2-08-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-09-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-12-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-30-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	2-19-80

Expiration of patents: The patents within the range of numbers indicated below expire during September 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,146,459 to 3,151,328, inclusive

Plant Patents ..... Numbers 2,444 to 2,448, inclusive

REISSUES

OCTOBER 13, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,765

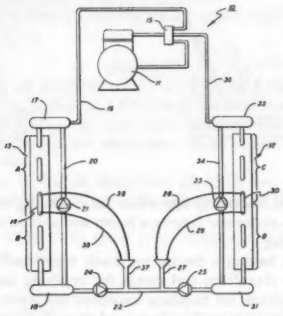
HEAT PUMP SYSTEM

Rudy C. Bussjager, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Original No. 4,057,975, dated Nov. 15, 1977, Ser. No. 720,721, Sep. 7, 1976. Application for reissue Nov. 15, 1978, Ser. No. 960,997

Int. Cl.[3] **F25B** *1/00, 13/00;* **F28F** *27/02*

U.S. Cl. 62—115 **9 Claims**



1. In a heat pump system having a compressor, a pair of heat exchangers and means for selectively reversing the flow of refrigerant through the system so that the function of the exchangers is also reversed, the improvement comprising

means for separating each exchanger into a plurality of heat transfer zones, each zone containing a number of flow circuits,

flow control means for routing refrigerant discharged from the compressor through each of the zones of one exchanger in a series flow progression and routing the refrigerant discharged from said one exchanger into the other exchanger simultaneously through each of the zones of said other exchanger whereby flow is parallel through the zones, and

switching means operatively associated with said flow control means for automatically reversing the flow geometry through the exchangers in response to reversing the flow of refrigerant through the system whereby refrigerant flow is parallel through said one exchanger and in series through said other exchanger.

3. A heat pump system having a compressor, an indoor coil, an outdoor coil, a reversing valve for delivering refrigerant discharged from the compressor to the indoor coil during heating operations and to the outdoor coil during cooling operations, the method of processing refrigerant through the system including the steps:

separating the indoor and outdoor coils into a plurality of heat transfer zones, each zone having a number of flow circuits passing through the coil associated therewith,

routing the refrigerant delivered from the compressor to the outdoor coil during the cooling operation so that refrigerant flows through each of the heat transfer zones in a series progression,

delivering the refrigerant discharged from the outdoor coil to each of the heat transfer zones of the indoor coil simultaneously so that the refrigerant flows through the zones in a parallel flow,

returning the refrigerant from the indoor coil to the compressor to complete the cycle, and

reversing the flow geometry through the indoor and outdoor coils in response to a change in the systems operation whereby refrigerant flow in series through the zones of the indoor coil and in parallel through the zones of the outdoor coil.

Re. 30,766

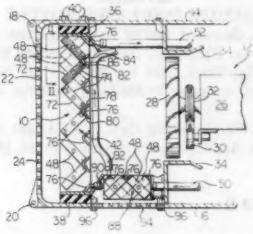
MODULAR HEAT EXCHANGER WITH PIVOTAL CORES

Erwin J. H. Bentz, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Original No. 4,076,072, dated Feb. 28, 1978, Ser. No. 620,999, Oct. 9, 1975. Application for reissue May 21, 1980, Ser. No. 152,014

Int. Cl.[3] **F28G** *13/00*

U.S. Cl. 165—41 **19 Claims**



9. An internal combustion engine having a heat exchanger with a top tank and a bottom tank, said top tank being connected to said engine for receiving heated coolant, said bottom tank being connected to said engine for returning cooled coolant to said engine, a plurality of cooling cores extending between said top tank and said bottom tank, means for *pivotally* mounting each said cooling core at an angle with respect to each other and at an angle to the plane lying perpendicular to the axis of the engine whereby increased cooling core surface is exposed to oncoming air passing through said heat exchanger.

Re. 30,767

METHOD USING LIGNOSULFONATES FOR HIGH-TEMPERATURE PLUGGING

Betty J. Felber; Dwight L. Dauben, and Richard E. Marrs, all of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Original No. 4,074,757, dated Feb. 21, 1978, Ser. No. 795,341, May 9, 1977. Continuation of Ser. No. 710,963, Aug. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 592,849, Jul. 3, 1975, abandoned. Application for reissue Oct. 15, 1979, Ser. No. 85,071

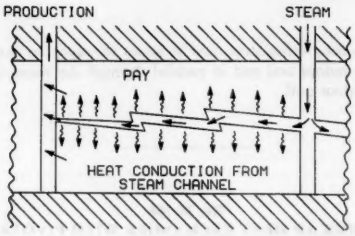
Int. Cl.[3] **E21B** *33/138, 43/24*

U.S. Cl. 166—261 **25 Claims**

13. A method for treating an underground zone having a temperature in excess of about 250° F. which comprises:

introducing into said zone an aqueous gel-forming solution of a water-soluble lignosulfonate, wherein said solution comprises

at least about 2.5 weight percent reducing sugars based on the weight of said water-soluble lignosulfonate and



maintaining said gel-forming solution in said zone until said gel-forming solution is converted to a gel.

Re. 30,768

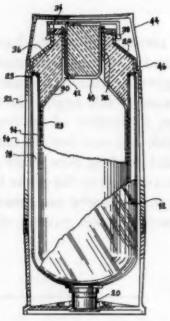
VACUUM INSULATED BOTTLE

Carl Bramming, deceased, late of Nashville, Tenn.; by Clara B. Bramming, heir, Plainfield, Ind.; by Kenneth R. Bramming, heir, Nashville, Tenn., and by Beverley B. Wheeler, heir, Plainfield, Ind., assignors to Aladdin Industries, Incorporated, Chicago, Ill.

Original No. 3,910,441, dated Oct. 7, 1975, Ser. No. 446,695, Feb. 28, 1974. Application for reissue Nov. 16, 1976, Ser. No. 742,224

Int. Cl.³ A47J *41/02*

U.S. Cl. 215—13 R **14 Claims**



12. An insulated bottle for containing foodstuffs or the like comprising an outer case, a liner received within said outer case and spaced therefrom for a major portion of the depth of said liner, said liner having an outer configuration of substantially cylindrical shape and terminating at one end thereof in a constricted neck and defining a cavity adapted to receive foodstuffs or the like, a vacuum filler having a generally cylindrical configuration and an opening at one end thereof interposed between said outer case and the cylindrical portion of said liner, the upper end of said vacuum filler terminating contiguous to the juncture between said liner cylindrical portion and its neck, a body of insulating material received between a portion of said outer case and said neck, said body of insulating material having a configuration conforming generally in shape to said neck and terminating contiguous to the juncture of said neck and said liner cylindrical portion, said body of insulating material being formed with a recess therein for receiving and supporting the upper end of said vacuum filler.

Re. 30,769

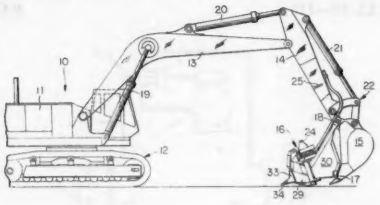
MOUNTING ARRANGEMENT FOR IMPACT ROCK-BREAKER

Delwin E. Cobb, Peoria; Jerry D. Fidler, East Peoria, both of Ill.; Nathan Gutman, Simsbury, Conn.; Richard E. Livesay, Peoria, Ill.; Gerald P. Simmons, Washington, Ill., and Orrin A. Stemler, East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,915,501, dated Oct. 28, 1975, Ser. No. 526,280, Nov. 22, 1974. Application for reissue Aug. 29, 1979, Ser. No. 70,934

Int. Cl.³ E02F *3/96*

U.S. Cl. 299—67 **29 Claims**



1. Material-fracturing apparatus for mounting adjacent the bucket of an excavator having a boom and a stick, said apparatus comprising:

a housing having a fracturing shank supported by and extending therefrom and means for applying impact blows to said shank for breaking hardened materials;

bracket means extending from *and pivotally mounted to* said housing for pivotal connection to the stick of [an] *the* excavator adjacent the bucket of said excavator;

an actuatable hydraulic cylinder pivotally connected to said housing and to said bracket means at locations sufficient for controllably, pivotally moving said housing relative to said bracket means for relative angular adjustment about an axis extending at substantially a right angle to the pivotal connection of said housing to said stick;

first latch means for latching said housing means to said bucket for manipulation of said fracturing device into operative position by manipulation of said bucket; and

second latch means for latching said housing to said stick to permit free operation of said bucket.

Re. 30,770

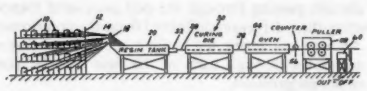
METHOD FOR FABRICATING IMPROVED FIBER REINFORCED PLASTIC RODS HAVING A SMOOTH SURFACE

Samuel M. Shobert, Mishawaka, and Elson B. Fish, Lakeville, both of Ind., assignors to Plas/Steel Products, Inc., Walkerton, Ind.

Original No. 4,154,634, dated May 15, 1979, Ser. No. 835,825, Sep. 22, 1977. Application for reissue Apr. 21, 1980, Ser. No. 142,456

Int. Cl.³ B32B *31/04*

U.S. Cl. 156—180 **17 Claims**



14. The method of fabricating a solidified bundle of fibrous strands in a body of resinous material comprising the steps of:

(a) impregnating all of a plurality of fibrous strands with a liquid heat-hardenable resin,

(b) collecting all of said impregnated strands into a resin wetted bundle and unidirectionally intermittently pulling said bun-

dle through an elongated closed hollow die device thereby providing alternate pulling and dwell, said die device being filled with said bundle during pulling and said bundle being fully impregnated prior to entry into said die device, said intermittent pulling being in substantially equal length increments, said dwell being for substantially equal time increments,

(c) heating said bundle while within said die device to solidify said resin, said pulling, heating and dwell of said bundle being so controlled that

(i) resin in the bundle which emerges from the die device is fully solidified and the resin in the bundle at the point of entry into the die device is not solidified,

(ii) the surface of the emerging bundle corresponds to the polish of the surface of said die device,

(iii) is substantially devoid of imperfections due to resin build-up within said die device, and

(iv) the emerging bundle is devoid of internal fractures.

Re. 30,771

METHOD OF PROTECTING THE HULLS OF MARINE VESSELS FROM FOULING

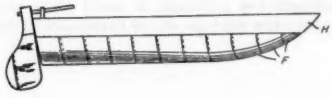
Klaus Zondek, Cinco de Abril 4534, Santiago, Chile

Reissued No. Re. 29,072, dated Dec. 14, 1976, Ser. No. 611,633, Sep. 9, 1975.

Original No. 3,761,334, dated Sep. 25, 1973, Ser. No. 191,233, Oct. 21, 1971. Application for reissue Jul. 9, 1979, Ser. No. 55,607

Int. Cl.[3] **E04B** *2/00;* **B31F** *1/00;* **B21D** *35/00;* **B63B** *3/00*

U.S. Cl. 156—196 **13 Claims**



1. A method of protecting **from marine growth** the contoured hull of a marine vessel **[[**from marine growth**]] having a clean, non-conductive, smooth, hard surface,** which comprises providing a metal foil of anti-fouling metal in strip form, **coating one face of said foil with a layer of pressure-sensitive adhesive** and progressively rolling said **coated** foil strip into conforming pressure contact **directly** with said hull **surface with successive strips of said foil overlapping and** with **[[**a**]] said** layer of **pressure sensitive** adhesive between said foil strip and the hull surface **and between overlapping portions of said foil strips**, to adhesively bond said foil throughout its area to the exterior surface of said contoured hull below the water line **and to bond adjacent strips of foil to one another,** said foil being sufficiently thin to be easily applied and sufficiently thick to provide protection against fouling for a period of from two to five years.

Re. 30,772

AMIDE-MODIFIED URETHANE ACRYLATE RADIATION CURABLE COMPOUNDS AND COATING COMPOSITIONS AND METHODS OF MAKING SAME

Charles B. Friedlander, Glenshaw; Gerald W. Gruber, Wexford, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Original No. 4,153,776, dated May 8, 1979, Ser. No. 890,895, Mar. 28, 1978. Application for reissue Jun. 2, 1980, Ser. No. 155,711

Int. Cl.[3] **C08G** *18/38*

U.S. Cl. 525—421 **40 Claims**

1. Addition polymerizable compound having **[**at least**]** one *or two* amide **[**group**]** *groups,* at least **[**one**]** *three* urethane **[**group**]** *groups* and at least one **[**ethylenically unsaturated functional**]** *acrylate or methacrylate* group comprising the reaction product of **[**the**]** components **[**of**]** *comprising:*

(a) an amide-containing compound **[**having**]** *which contains one or two amide groups and* at least one NCO-reactive hydroxy functional group;

(b) a polyisocyanate *which is a diisocyanate or a triisocyanate;* **[**and**]**

(c) a polyfunctional compound **[**containing at least one functional group reactive with an isocyanato group of said polyisocyanate and**]** which **[**polyfunctional compound**]** provides at least one **[**ethylenically unsaturated functional**]** *acrylate or methacrylate* group in said reaction product, *said polyfunctional compound being a hydroxy-containing ester of acrylic acid or a hydroxy-containing ester of methacrylic acid; and*

(d) polyol selected from the group consisting of polyester polyol and polyether polyol.

Re. 30,773

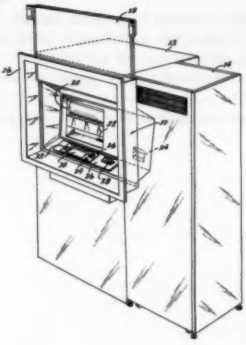
TRANSACTION TERMINAL

Paul F. Glaser, Culver City, and Richard J. Orford, Hermosa Beach, both of Calif., assignors to Transaction Technology, Inc., Los Angeles, Calif.

Original No. 4,134,537, dated Jan. 16, 1979, Ser. No. 790,764, Apr. 25, 1977. Application for reissue Nov. 5, 1979, Ser. No. 91,509

Int. Cl.[3] **G06F** *15/30;* **G07F** *7/08*

U.S. Cl. 235—379 **74 Claims**



1. A terminal for providing for the performance of transactions by a user on a step by step basis, including,

a visual display *formed by an electronic display* for displaying to the user at specific steps in a transaction instructional text to the user for the performance by the user to advance the transaction on a step by step basis *and with this electronic display electronically programmable for modifying the instructional test,*

a plurality of function selectors located adjacent the visual display at a position corresponding to the location of particular instructional text on the visual display for selection in the successive steps of individual ones of the function selectors in the plurality to advance the transaction sequentially through the successive steps,

the visual display including at particular ones of the steps in transaction instructional text providing for a selection between individual ones of the function selectors in the plurality to advance the transaction to the next steps,

means coupled to the function selectors for enabling, at the particular ones of the steps, only the individual ones of the function selectors capable of being selected at such steps, and

means responsive to the selection, from the individual ones of the function selectors at each of the particular steps, of a particular one of such function selectors for providing for the performance of individual transaction in accordance with such selection.

PLANT PATENTS

GRANTED OCTOBER 13, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,775

GAZANIA PLANT

Paul C. Enright, 11615 Riverside Dr., Lakeside, Calif. 92040

Filed Jul. 28, 1980, Ser. No. 173,183

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Gazania plant substantially as herein described, characterized particularly as to novelty by its unique flower and varying leaf form.

4,776

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Werther Strasse 112, D-4294 Isselburg, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,395

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name Texas, as described and illustrated, and particularly characterized by its vigorous and very uniform growth habit, dark green, shiny leaves, upright stems each of which carries 7–12 flowers, and by its large blue frilled flowers which are long lasting and non-dropping.

4,777

AFRICAN VIOLET PLANT

Reinhold Holtkamp, Werther Strasse 112, D-4294 Isselburg, Fed. Rep. of Germany

Filed Jul. 25, 1980, Ser. No. 172,396

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet known by the cultivar name South Carolina, as described and illustrated, and particularly characterized by its vigorous growth habit; intensive green leaves; strong upright flower stems; large star-shaped white flowers, with wavy petal edges, and by its florif-erous corolla, which is positioned well above the leaves.

PATENTS

GRANTED OCT. 13, 1981

ERRATA

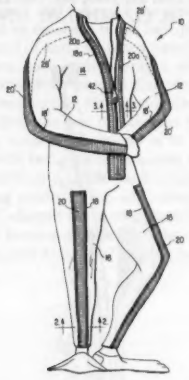
For CLASS	See PATENT NO.
411–345	4,294,156
411–185	4,294,300
501–129	4,294,618
376–404	4,294,658
376–442	4,294,660
376–363	4,294,661
219–061	4,294,662
361–318	4,294,715
424–049	4,294,894

PATENTS

GRANTED OCTOBER 13, 1981

GENERAL AND MECHANICAL

4,293,957
WET SUIT
Joel D. Melarvie, Box 1977, 304 E. Rosser, Bismarck, N. Dak. 58501
Filed Jan. 25, 1980, Ser. No. 115,355
Int. Cl.[3] A62B *17/00*
U.S. Cl. 2—2.1 R **12 Claims**

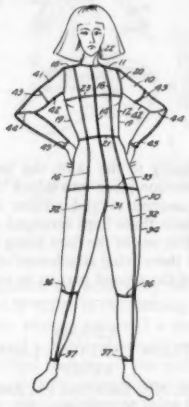


1. A wet suit for use under water, or the like, comprising a tight form fitting garment of waterproof material having a slit in at least one portion thereof, said slit being closed by a piece of elastic fabric secured to both edges of the slit and a flap of watertight material secured to one edge of the slit and overlapping the other edge of the slit by a substantial amount, whereby said garment is stretchable in the area of the slit while said flap seals against entry of water.

4,293,958
HEAD GEAR
Christian W. Zauner, 4139 SW. Archer Rd., Gainesville, Fla. 32608
Filed May 27, 1980, Ser. No. 153,048
Int. Cl.[3] A61F *9/04*
U.S. Cl. 2—12 **8 Claims**

1. An article of apparel of the type to be worn on the head, said article comprising: support means including at least in part a band means, said band means having a substantially circular configuration and disposable in surrounding relation to a portion of the head of the wearer; visor means attached to said support means and including a pouch means, a substantially flat visor support means mountable on the interior of said pouch means, said pouch means disposed relative to said band means to extend outwardly therefrom when said visor support means is mounted on the interior of said pouch means, whereby said visor means is positioned to offer shade to a predetermined portion of the wearer's head, said pouch means and said band means are formed from a substantially flexible moisture absorbent material, said pouch means being disposed in a folded over relation to itself and in at least partially surrounding relation to a predetermined length of said band means, upon absence of said visor support means from the interior of said pouch means, said predetermined length substantially equal to the transverse dimension of said visor means, whereby said band means is disposed so as to substantially function as perspiration absorbing band when mounted on the head of a wearer.

4,293,959
STRETCH KNIT BODY SUIT WITH PADDED AREAS
Debbie A. Gioello, 237 Van Cortlandt Park Ave., Yonkers, N.Y. 10705
Filed Dec. 26, 1979, Ser. No. 106,496
Int. Cl.[3] A41B *17/02*; D06C *14/00*; A41H *1/00*
U.S. Cl. 2—243 B **2 Claims**

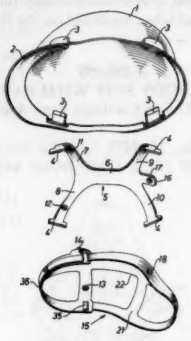


1. As a new article of manufacture, a stretch body suit used for the forming of a precision garment pattern corresponding to the figure of a wearer, said suit consisting substantially of knitted material and having a plurality of elongated padded areas on the outer surface thereof, said padded areas being stretchable along the principal axis thereof with said body suit, said padded areas being adapted to receive pins for retaining panels in position upon the suit while worn, while shielding the wearer from penetration of said pins; said padded areas defining a plurality of horizontally disposed lines encircling the wearer at the neck, shoulders, bust, waist, hips, knees, ankles, biceps, elbows and wrists; said padded areas defining a plurality of vertical lines at the armscyes, center front, center back, and sides of the torso, and the inner and outer sides of the arms and legs of said bodysuit.

4,293,960
HEADGEAR
Tore G. Palmaer, S-330, 30 Gnosjö, Sweden
Filed May 22, 1979, Ser. No. 41,540
Claims priority, application Sweden, May 30, 1978, 7806254
Int. Cl.[3] A42B *3/02*
U.S. Cl. 2—416 **7 Claims**

1. Protective headgear for mounting within a helmet, comprising an impact-absorbing crash element having means thereon for releasable attachment to cooperable means carried by a helmet shell whereby said crash element is mountable to extend within the helmet shell in spaced relation thereto, said crash element also having means thereon for adjustably and releasably attaching same in spaced superposed relation to a helmet lining; and a helmet lining which comprises a first

curved section adapted to cover the nape of the neck and a second curved section adapted to cover the forehead, said first curved section including a first transverse strip arranged to form side pieces in the lining when assembled and three flaps arranged in sequence along the length of said transverse strip, the two outer ones of the flaps being arranged to be secured to the middle one of the flaps to form a domed configuration



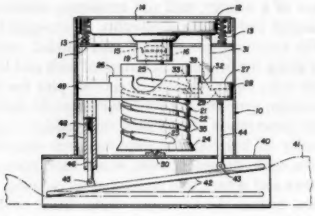
conforming generally to the skull; the helmet lining further comprises a connection piece into which the middle flap continues; and said second curved section including a second transverse strip with three flaps arranged along the length of the strip, the middle one of the flaps being connected with the connection piece, there being attachment element to secure the two other flaps of the second part to its middle flap.

4,293,961

PULSATILE FLOW CARDIOPULMONARY BYPASS PUMP

Thomas M. Runge, 2501 Galewood Pl., Austin, Tex. 78703

Filed Mar. 26, 1980, Ser. No. 134,089
Int. Cl.[3] A61F *1/00;* **A61B** *19/00;* **F04B** *43/00*
U.S. Cl. 3—1.7 **6 Claims**



1. A pulsatile flow pumping mechanism particularly adapted to operate a cardiopulmonary bypass device comprising a rotary spinner having a spiral groove including a partial retainer wall and entrance and exit groove portions of increased width and progressively decreasing depth beyond the terminals of the partial retainer wall, power drive means connected with the spinner to rotate it in one direction, a ring follower housing surrounding the spinner and operatively coupled with said bypass device and adapted to traverse the spinner axially of the spinner and being held against rotation with the spinner, a holding magnet on the ring follower housing radially outwardly of the spinner, a magnetically attractable groove rider mounted for movement radially of the spinner within a passage of the ring follower housing which is in alignment with said magnet, camming surface means on the spinner near one end thereof including the exit groove portion of the spinner engageable with said rider to displace the rider radially outwardly into held engagement with said magnet with the rider radially beyond the periphery of the spinner, and stationary cam means near the opposite end of the spinner and radially outwardly of the periphery of the spinner to strip said rider from the holding magnet and move it into said entrance groove portion.

4,293,962

BONE PLUG INSERTING SYSTEM

Robert L. Fuson, Warsaw, Ind., assignor to Zimmer USA, Inc., Warsaw, Ind.

Filed Feb. 14, 1980, Ser. No. 121,560
Int. Cl.[3] A61F *1/00, 1/24*
U.S. Cl. 3—1.9 **9 Claims**

1. A device for plugging the medullary canal comprising the combination of:

(a) a means for plugging the medullary canal made of a biologically compatible material, and wherein said plugging means has a proximal and a distal end and is round in cross-section and tapered from a larger diameter at the proximal end of the plug to a smaller diameter at the distal end of the plug, and wherein the proximal portion of the plugging means has tooth-like steps in which the diameter decreases in a series of steps, each perpendicular to the length of the plugging means and then tapering back out toward the distal end and approaching the original diameter, but with the outer diameter of each successive step being slightly less in diameter than the previous step as the steps progress from the proximal end toward the distal end of the plugging means, and wherein each step is a continuous ring about the plug, and;

(b) a means for inserting the plugging means into the canal; and

(c) a means associated with said plugging means and inserting means for engaging and disengaging the plugging means from the inserting means.

4,293,963

UNRESTRAINED ELBOW PROSTHESIS

Barry L. Gold, and Richard C. Bolesky, both of Warsaw, Ind., assignors to Zimmer USA, Inc., Warsaw, Ind.

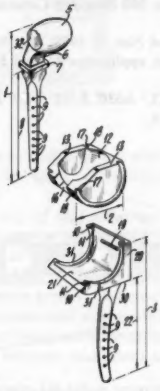
Filed Feb. 14, 1980, Ser. No. 121,559
Int. Cl.[3] A61F *1/03*
U.S. Cl. 3—1.91 **4 Claims**

1. An unrestrained elbow prosthesis comprised of the combination of:

(a) a humeral component formed of a bio-compatible metal alloy having an elongated stem with a substantially cylin-

drical articulating surface on the distal end of said stem and a supporting collar outwardly extending from the stem and located toward the distal end of the stem, but proximal to the substantially cylindrical articulating surface and separated from the cylindrical surface by a neck portion, said substantially cylindrical surface being convex such that the diameter of the midportion of the cylindrical shape is greater than the flat circular ends of the cylindrical shape; and

(b) an ulnar component consisting of a bio-compatible metal alloy retainer, and a bio-compatible non-metal bearing and an engaging means for attaching said non-metal bearing to the metal retainer and wherein the retainer has an elongated stem and an enlarged metal base portion attached to the proximal end of said elongated stem by a widened base support portion, said stem having a side which spreads into a first rectangular shaped flat plane with a second substantially rectangular plane projecting upward at a 90 degree angle from the first rectangular plane, each of said planes having some thickness so as to create said metal base portion with two parallel retaining walls separated by a retaining platform wherein each retaining wall, as well as the retaining platform, has an L-shaped outer configuration and a C-shaped inner configuration for supporting the non-metal bearing attached by the engaging means to the metal base, said non-metal bearing having a cylindrical



outer bearing surface for mating with the C-shaped retaining platform, an inner concave substantially cylindrical articulating bearing surface, for mating with or receiving the said substantially convex articulating surface of the humeral component, and two parallel side walls between which both of said inner and outer bearing surfaces are disposed, and wherein the engaging means for attaching said non-metal bearing to the metal retainer of the ulnar component includes a first pair of circular ribs and a first pair of circular grooves on the metal base with one circular rib and one circular groove being disposed on the inner side of each of said parallel retaining walls, and wherein the retaining platform is cylindrical and contains a longitudinal protuberance and wherein the engaging means also includes a second pair of circular ribs and a second pair of circular grooves on the non-metal bearing with one circular rib and one circular groove being disposed on the outer surface of each of said parallel side walls, and wherein the outer cylindrical surface of the non-metal bearing contains a longitudinal indentation, and said engaging means is adapted such that the first pair of circular grooves slidably receives the second pair of circular ribs and the second pair of circular grooves slidably receives the first pair of circular ribs whereby engagement of the non-metal bearing into the metal retainer is achieved by circular rotation of the bearing while the pairs of grooves and ribs are engaged, and whereby further forced circular rotation allows the longitudinal protuberance on the metal retaining platform to engage the corresponding longitudinal indentation on the outer cylindrical surface of the non-metal bearing to engage and subsequently lock the bearing into place on the metal retainer.

4,293,964

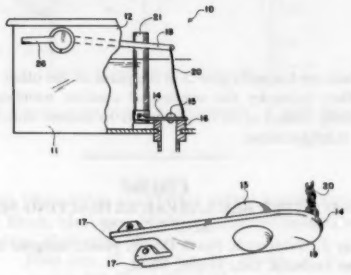
DESIGN FOR FLUSH TANK CONTROL USING NON-BUOYANT FLAPPER VALVE

Rudolph T. Riedel, 7198 Sugarbin St., Orlando, Fla. 32807

Filed Sep. 2, 1980, Ser. No. 183,287

Int. Cl.³ E03D *1/34*

U.S. Cl. 4—378 **1 Claim**



1. A flush arrangement for preventing the utilization of an unnecessary amount of water in the flushing of a toilet of the type having a water storage tank and a handle movable to bring about a lifting of a water release device from its seat to accomplish a controlled flushing of the toilet, and water release device being a pivotally mounted non-buoyant, one piece solid rubber flapper valve, said flapper valve including a generally flat member having a sealing portion, an integral generally ball-shaped portion disposed centrally on said seating portion and surrounded thereby, said ball shaped portion being of solid construction utilizing no air pocket to render it buoyant, with a greater proprotion of said ball shaped portion being above said flat member than below it, means connecting a portion of said flapper valve to said handle so that handle manipulation brings about a pivotal upward movement of said non-buoyant flapper valve away from its seat, thus permitting a controlled flow of water from said tank, said flapper valve, because of its non-buoyance and weight of said ball-shaped portion returns to its seat the moment said handle is released, such that the flow of water from the tank will be instantly shut off by the substantially flat sealing portion of said flapper valve.

4,293,965

UNITARY FURNITURE ELEMENT

Margaret C. Hrubec, 220 E. 27th St., Apt. 17, New York, N.Y. 10016

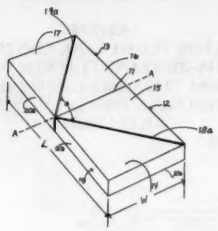
Filed Jun. 2, 1980, Ser. No. 155,437

Int. Cl.³ A47C *27/14, 17/04*

U.S. Cl. 5—465 **6 Claims**

1. A unitary furniture element comprising a segmented cushion member of uniform thickness having in plan view a rectangular shape with a length of twice its width, with a center line of the cushion member dividing same into two square portions in plan view, the cushion member being segmented into four isosceles right triangular sections arranged such that the two sections bounding the center line coextensively abut along their corresponding legs and the two sections in each square portion coextensively abut one another along their hypotenuses such that the respective lines of abutment of the sections in the square portions intersect at right angles, the sections

being hingedly joined such that on one rectangular face of the cushion member the two sections bounding the center line are hingedly joined in the plane of the one rectangular face and on the other rectangular face, the two sections in each square



portion are hingedly joined in the plane of the other rectangular face, whereby the segmented cushion member may be pivotally folded at its hinged joints to assume multiple furniture configurations.

4,293,966

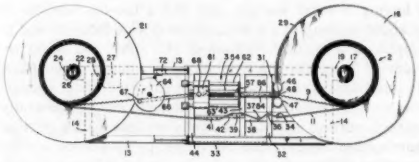
LEAFCUTTER BEE LARVAE EXTRACTING METHOD AND DEVICE

LeRoy J. Weiderrich, North Havre, Mont., assignor to Pollination Technics, Inc., Havre, Mont.

Filed Oct. 9, 1979, Ser. No. 82,991

Int. Cl.[3] A01K *51/00*

U.S. Cl. 6—12 R **19 Claims**



1. Apparatus for cleaning a bee hive which includes a spirally wound strip, the surface thereof having bee larvae adhered thereto comprising in combination:

means to unwind said strip,

extractor means operatively associated with said unwinding means for scraping the surface of said strip in a direction transverse to the direction of unwinding of said strip to remove the larvae therefrom, and

control means for operating said extractor means to scrape the surface of an unwound portion of said strip.

4,293,967

PIVOTAL DECK RAMP

Thomas M. Ord, Rte. 1, Box 174 D, Vaughn, Wash. 98394

Filed Apr. 30, 1979, Ser. No. 34,635

Int. Cl.[3] B63B *17/00*

U.S. Cl. 9—1.6 **10 Claims**

1. A deck ramp for the disembarking of passengers from boats comprising:

a first ramp section;

a means of attaching the ramp to a boat whereby the first ramp may be pivoted about the means of attachment;

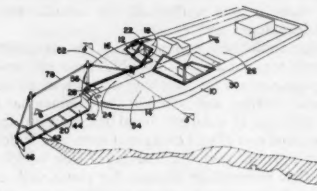
a second ramp section;

a hinge which attaches the second ramp section to the first ramp section wherein when the first ramp section is placed in the closed position, the second ramp section is capable of positioning itself beneath the first ramp section, and when the first ramp section is in the open position, the second ramp is capable of pivoting as an extension of the first ramp section.

a first rail affixed to the first ramp section;

a hinge affixed to the inner hull of the boat;

a second rail affixed to the hinge; and



a line affixed to the first rail and affixed to the second rail such that when the deck ramp is placed in the open position the line pivots the second rail about the hinge affixed to the boat to an approximate vertical position.

4,293,968

INTERCONNECTED WATER SKIS

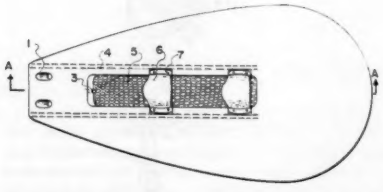
Elliott M. Levine, 393 Kingston Crescent, Winnipeg, Manitoba, Canada

Filed Nov. 6, 1978, Ser. No. 958,157

Claims priority, application United Kingdom, Nov. 11, 1977, 47063/77

Int. Cl.[3] A63C *5/00, 9/00, 11/00, 15/00*

U.S. Cl. 9—310 A **6 Claims**



1. A pair of buoyant water ski components or the like and means incorporated thereto connect said components in spaced and parallel relationship with one another to form a platform, and foot engaging means on the upper surface of each of said components, said connecting means including a connector member and means detachably securing said connector member by one end thereof to one of said skis and by the other end thereof to the other of said skis intermediate the ends of said skis, and approximately midway along the length of said skis, said connector member being in the form of a torsion bar whereby said skis are each movable independently in a fore and aft vertical pitching movement, within limits, around the axis of said connector member, due to the torsional characteristics of said connector, the connector means at the ends of said connector member including further means for maintaining the parallelism of said skis and facilitating horizontal plane rigidity of said skis.

4,293,969

INFLATABLE SEAL

Sylvan J. Frommelt, Peosta, Iowa, assignor to Frommelt Industries, Inc., Dubuque, Iowa

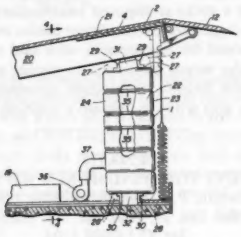
Filed Dec. 26, 1979, Ser. No. 107,034

Int. Cl.[3] E01D *1/00*

U.S. Cl. 14—71.1 **12 Claims**

10. In an adjustable dockboard for spanning the gap between a loading dock and the bed of a carrier in loading or unloading

position in front of the dock, the dockboard embodying a stationary mounting structure, a ramp having front and rear portions, with the rear portion hingedly connected to said mounting structure so that the ramp can swing up and down around a horizontal axis between a raised position wherein it is disposed at a forwardly opening acute angle to the horizontal above the floor of the loading dock and a lowered position wherein it is disposed in horizontally extending position wherein it is substantially flush with said floor of said loading dock, and said mounting structure including a depression in said loading dock, said depression embodying two oppositely disposed side walls, between which said ramp is disposed when it is disposed in said lowered position, a rear wall and an open front, and wherein the bottom of said ramp comprises a plurality of elongated beams extending between the front and rear edges thereof in substantially parallel spaced relation to each other, the combination of



a. means disposed between said beams at said front portion of said ramp for closing the spaces therebetween,
b. an inflatable member.
c. means securing the top of said inflatable member to the bottom of said beams across substantially the full width of said front portion of said ramp,
d. means securing the bottom of said inflatable member to the bottom of said depression across substantially the full width of said depression between said side walls thereof,
e. said inflatable member being movable upwardly and downwardly by said ramp between said raised and lowered positions of the latter, and
f. means for inflating said inflatable member, when said ramp is disposed in said raised position, to thereby yieldingly urge said inflatable member into sealing engagement with said side walls substantially throughout the height of the latter.

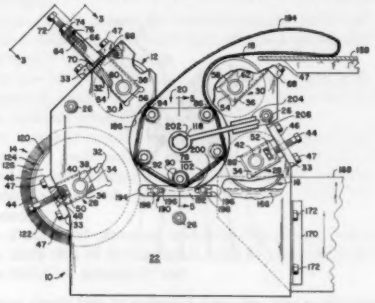
4,293,970

BELT CLEANING APPARATUS

Robert C. Bencene, Rte. 4, Jonesboro, Tenn. 37650, and Charles A. Granger, #3 Matson Ct., Johnson City, Tenn. 37601

Filed Jun. 28, 1979, Ser. No. 52,852
Int. Cl.³ A46B *13/02*
U.S. Cl. 15—21 D **10 Claims**

1. A cleaning apparatus for a continuous belt, comprising a base having elongated belt supporting mandrel means rotatably mounted thereon, said mandrel means having a plurality of belt engaging peripheral portions spaced from the rotational axis thereof, drive roll means for said continuous belt rotatably mounted on said base and having its rotational axis substantially parallel to the rotational axis of said mandrel means, belt cleaning means adjacent the periphery of said mandrel means and adapted to engage said belt, and a first one of said peripheral portions of said mandrel means being movable substantially parallelly into close juxtaposition to the periphery of said



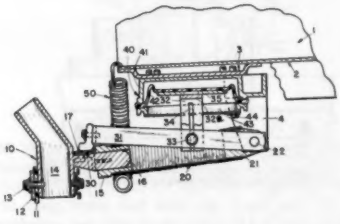
drive roll means upon rotative movement of said mandrel means.

4,293,971

FLOOR TREATING MACHINE WITH SQUEEGEE

Thomas S. Block, Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.

Filed Jun. 19, 1979, Ser. No. 49,884
Int. Cl.³ A47L *9/02*
U.S. Cl. 15—98 **30 Claims**



1. A floor treating machine, with a squeegee operably connected thereto for selective engagement or disengagement with the surface being treated, in which the improvement comprises: spring means, capable of flexing spring action in at least a side to side direction laterally of the direction of travel of the machine, secured at one end to said machine and at the other end to said squeegee, said squeegee being free of connection to said machine through a rigid linkage whereby it is free to shift laterally side to side not only relative to said machine but also relative to the normal longitudinal axis of said spring means through said flexing action of said spring means thereby allowing said squeegee to deflect out of the way of obstacles and not get hung up on corners or the like.

4,293,972

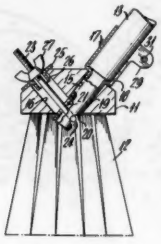
HANDLE ATTACHING MEANS FOR BROOMS AND THE LIKE

Francis Pomares, 124 Russell St., White Plains, N.Y. 10606

Filed Oct. 26, 1979, Ser. No. 88,649
Int. Cl.³ A46B *15/00*; F16B *35/06*
U.S. Cl. 15—145 **6 Claims**

1. A handle attachment for push brooms and the like having an elongated head with at least two angularly disposed openings positioned transversely of the head comprising tubular handle attaching means having an enlarged handle receiving and holding portion and a shank portion of smaller cross sectional area than and extending from said enlarged portion, the

end of said shank portion having a pair of diametrically disposed and aligned openings, and an elongated bolt extending through said pair of openings, said bolt having a head portion engaging said shank portion to prevent rotation of said bolt and



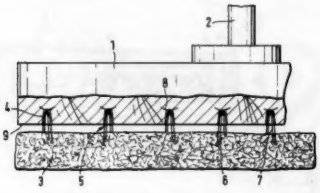
a cooperating nut, whereby insertion of said shank portion in one of said angularly disposed openings with said bolt extending through said aligned shank openings and the other angularly disposed opening and held in position by said nut secures said handle attaching means in position.

4,293,973

FLOOR CLEANING DEVICE

Ernst Schär, Stallikonerstrasse 73, 8903 Birmensdorf, Switzerland

Filed Oct. 22, 1979, Ser. No. 87,105
Int. Cl.³ A47L *11/14*
U.S. Cl. 15—230.17 **12 Claims**



1. A floor cleaning device of the kind having a holding plate from the lower face of which there projects a multiplicity of bristles distributed over the lower face, at least some of which have beaded ends for carrying along a cleaning pad, having the improvement which consists in that:

said holding plate has a number of bores, open at the bottom, in each of which at least one bristle is held which is bent over to provide legs of different length and is secured by means of a loop passing through the bend of each bristle in said bore, said legs diverging outwardly from the bore in which the bristle is secured;

the longer leg of at least one bristle in each bore is beaded at its end, and

a multiplicity of said bristle-equipped bores is distributed over the lower face of the holding plate and both the shorter leg and longer leg of each bristle of said bores projects on the lower face of the holding plate.

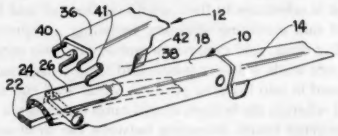
4,293,974

ARM TO BLADE CONNECTOR

Neil A. Gowans, Buffalo, and William C. Riester, Williamsville, both of N.Y., assignors to Trico Products Corporation, Buffalo, N.Y.

Filed May 19, 1980, Ser. No. 151,127
Int. Cl.³ B60S *1/40*
U.S. Cl. 15—250.32 **7 Claims**

1. A connector assembly for connecting a windshield wiper arm and a windshield wiper blade, said arm having a free end U-shaped in cross section, forming depending ears, a slot in each of said depending ears, said slot being open at the free end of said arm tip, said wiper blade having a channel-shaped central portion with depending side walls connected by a web at the upper edge of said side walls, elongate longitudinally extending aperture means extending over a central portion of



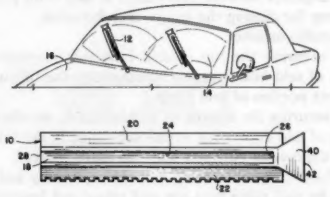
said web for receiving said depending ears and a cross pin exposed to said aperture means for receiving said slots; characterized in that a strike is disposed intermediate the side walls exposed to said aperture means, detent means are positioned on said ears disposed for engagement with said strike, said ears include shoulder means positioned to engage an abutting part of said blade for limiting longitudinal movement of the blade relative to the arm when in operative position.

4,293,975

ATTACHMENT FOR WINDSHIELD WIPER BLADES

Bobby J. Ainsworth, P.O. Box 182, Achille, Okla. 74720

Filed Jan. 14, 1980, Ser. No. 111,534
Int. Cl.³ B60S *1/04*
U.S. Cl. 15—250.41 **4 Claims**



1. An attachment for vehicle windshield wiper blades and comprising an elongated body having a slot extending longitudinally along one side thereof for receiving a wiper blade therein, scraper means provided on the opposite side edges of the body and extending longitudinally therealong to provide a scraping of the windshield during operation of the wiper blades, and transversely extending scraper means provided on one end of the body for manual scraping of the windshield for facilitating the scraping action of the longitudinal scraper means, wherein the transverse scraping edge comprises an angularly and outwardly extending flange, and ascraping edge provided at the outer end of the flange extending transversely with respect to the longitudinal axis of the body.

4,293,976

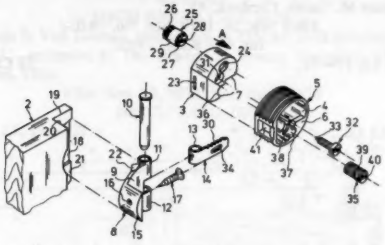
CABINET HINGE

Willi Pittasch, and Johannes Dalbert, both of Herford, Fed. Rep. of Germany, assignors to Firma Richard Heinze, Fed. Rep. of Germany

Division of Ser. No. 844,118, Oct. 20, 1977, Pat. No. 4,159,557.
This application Mar. 8, 1979, Ser. No. 18,456
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647776; Oct. 23, 1976, 2648095
Int. Cl.³ E05D *5/02, 7/04*
U.S. Cl. 16—129 **14 Claims**

1. A hinge for articulated connection of two surfaced components, said hinge comprising first and second hinge parts, said first hinge part comprising an outer anchoring sleeve

operable to secure said first hinge part in a recess in a first of said components and an inner body disposed in said sleeve, and said second hinge part comprising means operable to secure said second hinge part to a second of said components and a pivotally mounted hinge arm, one edge of said hinge arm defining a rack, said outer sleeve of said first hinge part having a first opening operable to receive said inner body for selective positioning along a first axis which axis is perpendicular to the



surface of said first components and a second opening operable to permit communication of said hinge arm and said inner body along a second axis which axis is parallel to the surface of said first component, said first hinge part having means operable to position said inner body along said first axis and said inner body having pinion operable to receive and engage said hinge arm for selective positioning along said second axis and means operable to position said hinge arm in said inner body along said second axis.

4,293,977

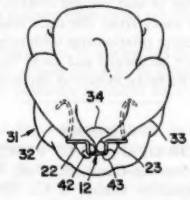
POULTRY TRUSSING DEVICE

Anthony J. Volk, 173 E. Syracuse St., and Henry J. Volk, P.O. Box 1484, both of Turlock, Calif. 95380

Filed Dec. 3, 1979, Ser. No. 99,470

Int. Cl.³ A22B *5/00;* **A22C** *21/00*

U.S. Cl. 17—11 **8 Claims**



1. An improved poultry trussing device formed of a thin elongated strip of rigid but resilient material having a central U-shaped section having a substantially straight bottom portion with substantially parallel extensions of the ends thereof with aligned shoulders extending therefrom substantially perpendicularly thereto and legs depending from said shoulders with hooked ends.

4,293,978

POULTRY HEAD PULLING APPARATUS

David M. McDonald, Kansas City, Kans., and Donald J. Scheier, Kansas City, Mo., assignors to Simon-Johnson, Inc., Kansas City, Mo.

Filed Oct. 1, 1979, Ser. No. 81,008

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—12 **2 Claims**

1. For use with an arcuate section of an overhead conveyor having means for uninterrupted horizontal advancement of a continuous train of birds pendulously suspended by their legs in a head down position, apparatus for processing said birds as they are advanced, said apparatus including:

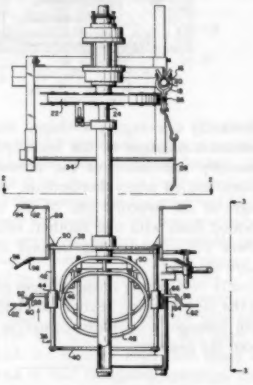
a rotor beneath the conveyor at said section mounted for rotation about an upright axis in timed relationship to said conveyor;

stationary guide means for maintaining the bodies of the birds confined to an arcuate path of travel spaced radially outwardly from said axis;

means attached to said rotor and rotatable therewith for separately capturing the head of each suspended bird as the birds are advanced;

means attached to said rotor and rotatable therewith for separately capturing the necks of each suspended bird as the birds are advanced, and having means for holding the bodies of the birds against descent as the birds are advanced,

each of said head capturing means having means for holding the neck skin of the captured head in a taut condition as the birds are advanced; and



means for progressively and separately lowering said head capturing means with respect to the rotor as the latter rotates until the heads are separated from neck skins adjacent their heads and until the heads pull the trachea, esophagus and crop from within the birds through their necks,

each head capturing means being provided with means for holding the heads oriented to point their beaks inwardly toward said axis,

with means for tilting the heads upwardly and inwardly toward said axis as the head capturing means is lowered during rotation thereof,

with means about which the head is tilted across a line extending transversely of the throat adjacent the larynx for pinching the esophagus against the roof of the mouth and

with an essentially V-shaped loop having a bight, a pair of legs diverging downwardly and outwardly from said bight and a horizontal arm extending outwardly from one of the legs.

4,293,979

FORMING PRESS FOR SAUSAGE AND THE LIKE

Gabriel A. Colosimo, and Ernest Colosimo, both of 9009 W. 2700 South, Magna, Utah 84044

Division of Ser. No. 830,838, Sep. 6, 1977, Pat. No. 4,148,598. This application Oct. 13, 1978, Ser. No. 951,028

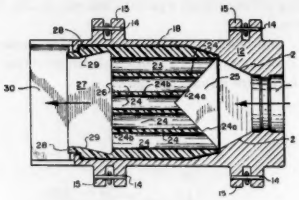
Int. Cl.³ A22C *11/00, 7/00*

U.S. Cl. 17—32 **2 Claims**

1. A food forming press comprising

a press body having upper and lower body halves;

means for clamping said body halves together in mating relationship to form a cavity open at each end;
an inlet opening to the cavity of the press body;
means for coupling the inlet opening of the press body to a discharge outlet of a meat grinder;
walls at the inlet opening of the press body angularly interconnecting the inlet opening and the cavity of the press;
an extrusion die formed to fit within the cavity of the two body halves of the press and containing a plurality of die passages therethrough, each said die passage being open to opposite ends of said cavity, said extrusion die comprising a housing containing a plurality of elongated extrusion passages;



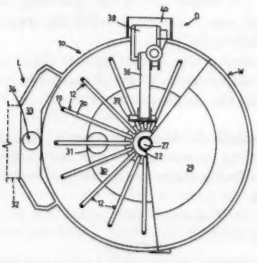
an inwardly converging V-shaped common inlet to the extrusion passages at the inlet opening of the press whereby said inlets of the extrusion passages have sharp, angled edges therearound, the ends of the passages at the opposite end of the extrusion die being formed flush with one another, said housing having a lower surface extending beyond the flush ends, and sidewalls; and
gradually converging inner surfaces of the said sidewalls of the die extending beyond the flush ends of the extrusion passages to slightly compress foodstuffs ejected from the passages.

4,293,980

METHOD FOR WASHING ANIMAL CASINGS

Roderick O. Ward, Havelock North, New Zealand, assignor to W & R Fletcher (N.Z.) Limited, Wellington, New Zealand

Filed Jun. 18, 1979, Ser. No. 49,804
Claims priority, application New Zealand, Jun. 30, 1978, 187739
Int. Cl.³ A22B *5/18*
U.S. Cl. 17—51 **11 Claims**



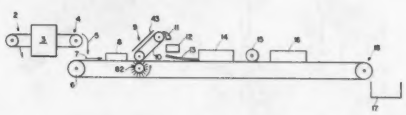
1. A method of mechanically washing an animal casing such as a bung, said method comprising the steps of
(a) placing the casing on an elongate support element so that said element extends through the interior of the casing, said element including means defining duct means for washing liquid and outlet means for the discharge of such liquid in the interior of the casing,
(b) causing washing liquid to issue under pressure from said outlet means thereby to wash the interior of the casing, and
(c) directing said washing liquid in the form of jets at an angle to the interior surface of the casing to rotate the casing around said element.

4,293,981

CRAB BUTCHERING MACHINE

Charles M. Smith, Cordova, Ak.

Filed Sep. 24, 1979, Ser. No. 78,036
Int. Cl.³ A22C *29/02*
U.S. Cl. 17—71 **32 Claims**



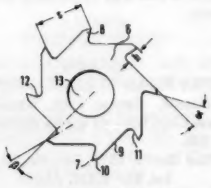
1. A cleaning machine for crabs having a body, gills, viscera in a body cavity, legs, tail, carapace, and pincers, comprising:
first endless conveyor means having a plurality of crab body engaging abutments spaced along its length for positively driving crabs along a conveying path in a conveying direction with their eyes facing in the conveying direction and their carapaces facing away from said conveyor means;
second endless conveyor means having a plurality of rigid projections;
means for mounting said second conveyor means for movement in a projection path substantially co-planar with said first conveying means so that said projection path intersects the conveying path of said first conveyor means;
means for driving said second conveyor means so that said abutments and said projections respectively in said conveying path and projection path have their movement timed with respect to each other so that a crab engaged by said abutments and being driven along said conveying path will have its carapace's leading edge struck by one of said projections of said second conveyor means to break said carapace away from the crab body, drive the carapace in a pivoting relationship with respect to the tail end of the carapace backward and away from said conveying path as the crab body moves in the conveying direction.

4,293,982

TOOL FOR OPENING UP FIBER BALES

Herr J. Marx, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trutzschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 24, 1980, Ser. No. 133,398
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1979, 2917122
Int. Cl.³ D01G *7/06*
U.S. Cl. 19—80 A **10 Claims**



1. A tool for opening up fiber bales, comprising a shaft adapted to be driven in rotation about an axis; and a plurality

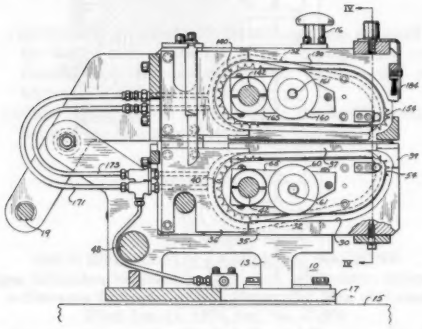
of axially spaced blades coaxially mounted on said shaft for rotation therewith and each having a periphery provided with projecting sawteeth adapted to engage the fiber of a fiber bale, each of said sawteeth being bounded by two flanks which include between themselves an angle of 20°–70° and the circumferential spacing between the tips of successive fronts of said sawteeth being between 60–180 mm.

4,293,983

HIGH SPEED GILL BOX

George S. Van Deusen, and Joseph F. Ogrinc, both of Gastonia, N.C., assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Sep. 19, 1979, Ser. No. 77,079
Int. Cl.³ D01G *19/10*
U.S. Cl. 19—127 **11 Claims**



1. A high speed gill box having a drafting zone through which textile sliver is drawn comprising:

a plurality of faller bars each having a plurality of pins extending therefrom and an integral crank arm formed on one end thereof;

path means for constraining movement of said plurality of faller bars to a defined path along which the faller bars can move;

a drive sprocket disposed at one end of the drafting zone for engaging some of said plurality of faller bars and pushing others of said plurality of faller bars along the defined path;

an idler sprocket disposed at the opposite end of the drafting zone for assisting in guiding movement of the faller bars from the drafting zone;

cam track means for receiving the crank arm of said plurality of faller bars to control orientation of the faller bars as they are pushed along the path;

a crowder roll disposed to contact said faller bars moving along the defined path to urge them into engagement with said drive sprocket; and, wherein,

the integral crank arm extends from one end only of each faller bar; and,

the integral crank arm extends from opposite ends of adjacent faller bars constrained by said path means.

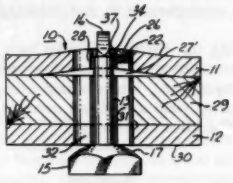
4,293,984

SPRING TENSION FASTENER

John Kaufmann, Jr., 3716 Woodrow Ave., Pittsburgh, Pa. 15227, assignor to John Kaufmann, Jr., Pittsburgh, Pa.

Continuation of Ser. No. 885,512, Mar. 13, 1978, abandoned.
This application Oct. 30, 1979, Ser. No. 89,756
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—221 R **1 Claim**

1. A spring tension fastener for tightly securing together in face-to-face relationship at least a pair of plate members substantial thickness fixed relative to each other, one of said plate members being formed of spring material and being arched to form a gap between it and the opposing plate member when the arched plate member of spring material is in a relaxed state, the opposing plate member being substantially flat, both of said plate members being provided with through openings which are elongated and which are in registration with each other, the face of the arched plate member formed of spring material away from the opposing flat plate member being provided with ramp surfaces at diametrically opposed locations and being further provided at diametrically opposed locations between the ramp surfaces with locking recesses, the common axis longitudinally across the locking recesses being at right angles to the major axis of said elongated openings, and a rigid pin fastener element including a straight shank adapted to pass through said registering openings of the plate members and having a turnable head with a rounded interior end face and



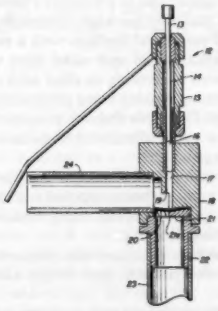
wrench flats on one end of the shank of a size unable to pass through said openings and bearing against the face of the flat plate member distant from the arched plate member and also having an elongated fastener head at the other end of the shank extending transversely and equidistantly beyond opposite sides of said shank, the fastener head having a side profile and an end profile approximating the configuration of the elongated openings and being sized to pass therethrough axially of the registering openings, said fastener head having diametrically oppositely disposed flat cam faces on its interior side adapted to rotationally pass over said ramp surfaces and drop into said locking recesses with the fastener head then being arranged across the major axis of said elongated openings, the arched plate member of spring material then exerting tension on said rigid pin fastener element.

4,293,985

METHOD AND APPARATUS FOR MAKING BOUNCE CRIMPED YARN

Philip C. Feffer, Silver Springs, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 7, 1980, Ser. No. 110,050
Int. Cl.³ D02G *1/16*
U.S. Cl. 28—254 **9 Claims**



1. A process for manufacturing a bounce crimped multifilament thermoplastic yarn having improved fiber-fiber coherency which comprises the steps of:

(a) supplying a drawn multi-filament thermoplastic yarn to an enclosed texturizer chambered bounce crimper comprising a texturizing chamber, a yarn entrance passage, a lateral yarn exit passage, a fluid inlet passage, a fluid exhaust passage axially aligned with said yarn entrance passage and a foraminous surface covering said fluid exhaust passage, and supplying a compressible heated fluid to said texturizing chamber with sufficient force to draw said yarn into said texturizing chamber and hurl it against said foraminous surface with sufficient force to axially compress said yarn and rebound and discharge said yarn from said bounce crimper through said yarn exit and whereby the bulk of said fluid passes through said foraminous surface and said fluid exhaust passage;

(b) obstructing a portion of said fluid exhaust passage to substantially prevent the occurrence of filament loops and filament entanglement in said discharged crimped yarn; and

(c) supplying the discharged crimp yarn to a fluid vortex interlacer, without substantially increasing the tension on said crimped yarn, wherein said crimped yarn is fluid interlaced to yield a bounced crimped yarn having improved fiber-fiber coherency.

4,293,986

METHOD OF MAKING A QUARTZ CRYSTAL OSCILLATOR

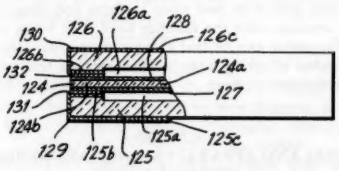
Masatoshi Kobayashi; George Shimakawa; Yukio Hara, all of Nagano; Hiroyuki Fujii, Suwa, all of Japan, and Kabushiki Kaisha Seikosha, 03, Suwa, both of Japan, assignors to Matsushima Kogo Kabushiki Kaisha, Toyko

Filed Dec. 5, 1978, Ser. No. 966,688

Claims priority, application Japan, Dec. 5, 1977, 52-145863; Dec. 5, 1977, 52-145864

Int. Cl.³ H01L *41/22*

U.S. Cl. 29—25.35 **3 Claims**



1. A method for manufacturing a quartz crystal oscillator package having a high internal vacuum, said package comprising a quartz crystal vibrator with a frame, a pair of housing elements having peripheral surfaces, said peripheral surfaces being shaped to register one to the other, a hermetic seal at the periphery of said oscillator package, comprising the steps of:

(a) coating said peripheral surfaces with a metal film;

(b) coating at least one of said metal films with a gas free material capable of forming an alloy with said metal film, said alloy forming coating being produced on said at least one said metal film at an ambient pressure less than 10^{-2} torr, whereby gas is eliminated from said alloy forming coating during step (b);

(c) positioning said coated housing elements in an opposed position, said coatings being opposed one to the other, said crystal vibrator with a frame being enclosed within said opposed housing elements;

(d) drawing a high vacuum over the elements of said quartz crystal oscillator package and within said housing elements;

(e) applying heat under said high vacuum to fuse said alloy forming coating with said metal film to form an alloy whereby said housing elements are rigidly and hermetically joined together and said package has said high internal vacuum within said joined housing elements.

4,293,987

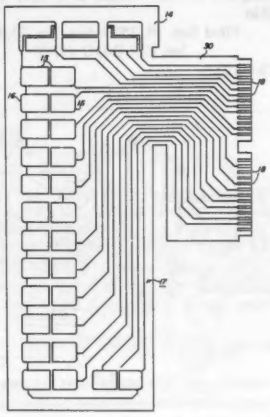
METHOD OF FABRICATING CAPACITIVE TOUCH SWITCH PANEL

Tom L. Gottbreht, Plano, and Glen C. Shepherd, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 105,802, Dec. 20, 1979, which is a continuation of Ser. No. 887,387, Mar. 16, 1978. This application Dec. 21, 1979, Ser. No. 106,294

Int. Cl.³ H01G *4/30*; H01H *9/26*

U.S. Cl. 29—25.42 **32 Claims**



1. A method of fabricating a capacitive touch switch panel comprising the steps of:

(a) forming conductive touch pads on one major surface of a rigid dielectric panel;

(b) forming pairs of spaced-apart conductive pads and conductive leads extending to said conductive pads on one of two opposite major surfaces of a flexible synthetic resin sheet; and

(c) bonding the second of the said two opposite surfaces of said flexible synthetic resin sheet to the opposite major surface of said rigid dielectric panel with each of said pairs of conductive pads in registered alignment with a respective one of said conductive touch pads.

4,293,988

CONTROLLED DEFLECTION ROLL

Mario Biondetti, Schio, Italy, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Apr. 28, 1980, Ser. No. 144,772

Claims priority, application Switzerland, May 15, 1979, 4499/79

Int. Cl.³ B21B *13/02*

U.S. Cl. 29—116 AD **6 Claims**

1. A controlled deflection roll comprising:

a stationary roll support;

a rotatable roll shell;

means for mounting said rotatable roll shell for rotation about said stationary roll support;

at least one pressure element for supporting the rotatable roll shell upon said stationary roll support;

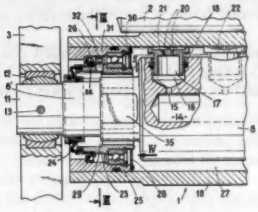
said pressure element being provided with bearing surface means upon which there bears said roll shell, during operation of said controlled deflection roll, with the aid of a liquid film;

said roll shell having opposed ends;

said means for rotatably mounting said roll shell comprising bearing means arranged at the opposed ends of said roll shell;

seal means for sealing the opposed ends of said roll shell towards the outside;

said roll shell and said stationary roll support forming therebetween an intermediate chamber;



a throttle disk provided with throttle openings arranged at the side of each related one of said bearing means confronting said intermediate chamber between said roll support and said roll shell; and

outflow means for the withdrawal of the liquid arranged between the bearing means and said seal means.

4,293,989

GLUE ROLLER FOR LABELLING MACHINE

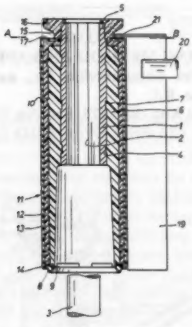
Egon Schneider, Neutraubling, Fed. Rep. of Germany, assignor to Hermann Kronseder, Worth, Donau, Fed. Rep. of Germany

Filed Jun. 11, 1979, Ser. No. 47,501

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1978, 282561

Int. Cl.³ B21B *31/08*

U.S. Cl. 29—130 **9 Claims**



1. Glue roller for labeling machines, with a metal hub for rotationally fixed mounting on a drive shaft, a tubelike support body fixed on the hub and with an elastic sleeve, having a cylindrical outer surface, seated on the support body, the hub and the support body being provided with interengaging recesses and projections, characterized in that the support body (6) is formed by a first moulded part of foam material having sealed boundary zones, which is foamed directly onto the hub (1), that the elastic sleeve (11) is formed by a second moulded part of elastic foam material with sealed boundary zones (13), which is foamed directly on the support body (6), that the foam material of the support body (6) has a lower elasticity than the foam material of the sleeve (11), and that the support body (6) and the elastic sleeve (11) are provided with interengaging projections (10) and recesses (12) which extend parallel to the axis of the roller.

4,293,990

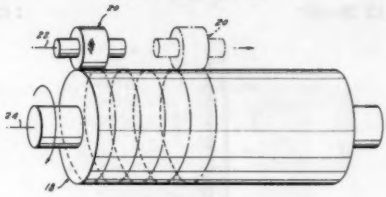
METHOD OF MAKING EMBOSSING ROLL FOR PRODUCING PAPER TOWELS

Stephen F. Pollock, Palatka, Fla., assignor to Hudson Pulp & Paper Corp., New York, N.Y.

Division of Ser. No. 842,161, Oct. 14, 1977, Pat. No. 4,181,068. This application Oct. 18, 1979, Ser. No. 86,079

Int. Cl.³ B21M *1/14*

U.S. Cl. 29—148.4 D **2 Claims**



1. The method of producing an embossing roll which includes, the steps of, producing an embossing tool which has a cylindrical surface bearing a continuous spiral pattern of identical embossing designs, rotating an unembossed roll about a first axis at a predetermined peripheral rate, rotating said engraving tool about a second axis which is parallel with said first axis and with said axes being so spaced that said engraving tool mates with the surface of said unembossed roll, and moving said engraving tool axially at a rate relative to said peripheral rate so that it moves the axial dimension of said design patterns during each complete rotation of said unembossed roll whereby a continuous spiral embossing design is produced on said unembossed roll.

4,293,991

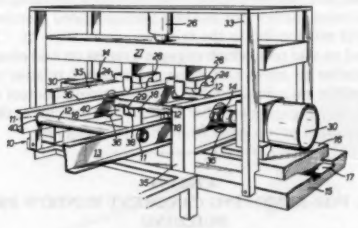
APPARATUS FOR ASSEMBLING LADDER-TYPE FRAMES

William Bailey, P.O. Box 73, Acacia Ridge 4110, Qld., Australia

Filed Sep. 17, 1979, Ser. No. 76,086

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—243.52 **19 Claims**



1. Apparatus for assembling frames of the type having transverse members extending between side members and connected thereto at each end by a compression joint, said apparatus including a main support frame for supporting a pair of connection-forming assemblies, each adapted to co-operate with an end of said transverse member adjacent a respective said side member, each said connection-forming assembly including compressing means located on the outside of said side member and adapted to co-operate with an anvil assembly located on the inside of said side member, said anvil assembly having two co-operating parts provided with complimentary recesses to receive said transverse members, one said part being fixed to a base plate slidably mounted on said support frame for movement in the direction parallel to said transverse members and wherein said compressing means is mounted on

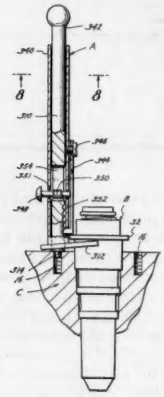
said base plate and movable with respect thereto whereby said anvil assembly and compressing means are movable towards one another and across said support frame to co-operate with the respective said end to form said compression joint.

4,293,992

DIESEL FUEL INJECTOR TOOL

James E. Webb, 13809 Hershie, Houston, Tex. 77015

Filed Sep. 17, 1979, Ser. No. 76,149
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—267 **1 Claim**



1. A tool for removing fuel injectors from diesel engines comprising:

an elongated member having a first end and a second end;

an injector engaging member fixedly mounted to a tube adapted for receiving the elongated member, said elongated member being movably mounted inside of the tube;

said injector engaging member engageable with the injector between a collar formed on the injector and the diesel engine for prying the injector from the diesel engine;

said first end of the elongated member being engageable with the diesel engine and having a locating means mounted thereon for holding said elongated member in a fixed relationship to the injector;

a pawl on said tube which engages a recess on said elongated member to move said elongated member relative to the injector engaging member for maintaining contact of the injector engaging member with the fuel injector as the fuel injector is pryed loose from the diesel engine.

4,293,993

TOOL FOR REMOVING CASEMENT WINDOW FROM BUILDING

James A. Baker, P.O. Box 71, Dunkirk, Md. 20754

Filed May 16, 1979, Ser. No. 39,379
Int. Cl.³ B26B *27/14*
U.S. Cl. 29—278 **4 Claims**

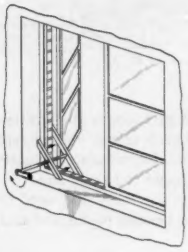
1. A tool for removing a casement window from the wall of a building, said casement window comprising a first frame containing the glass of said casement window, said first frame being contained in said wall by a second frame embedded in said wall, said tool comprising:

a first bar for bearing on the exterior vertical portion of the wall and on the vertical portion of the sill of the window adjacent to a selected corner of the window;

a second bar for bearing on interior portions of said first frame of said selected corner of said casement window, said second bar being shorter than said first bar, and said second bar having bevelled ends for bearing on vertical and horizontal portions of said first frame adjacent to said selected corner of said window;

a threaded rod connecting said first and second bars for controllably applying a force to pull said first and second bars together to move the corner of said first frame corresponding to said selected corner of said casement window past said embedded second frame towards the exterior of said building;

said first and second bars and said threaded rod comprising means for advancing said threaded rod within a selected one of said first and second bars upon rotation of said threaded



rod, and for preventing the advancement while allowing the rotation of the threaded rod within the other of said first and second bars upon said rotation of said threaded rod, and for allowing at least one of said bars to rotate in a direction towards said threaded rod during said removal of said casement window; and

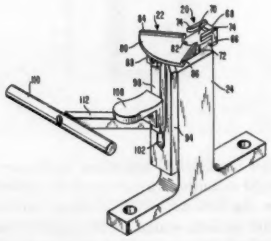
no-mar means mounted at each said end of said second bar for protecting the interior portions of said wall and sill adjacent to said selected corner of said casement window while said tool operates to move said second frame through said first frame.

4,293,994

SLIDERING METHOD AND APPARATUS

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 30, 1979, Ser. No. 70,940
Int. Cl.³ B23P *19/04*; B21D *53/50*
U.S. Cl. 29—409 **11 Claims**



1. A method of installing a slider on a pair of slide fastener stringers having respective end sections which are separated, the method comprising the steps of

positioning a slider on a support having a slider holding mechanism,

raising a stringer guiding means which has an upper surface and a pair of converging flanges in front of the slider so that the inner surfaces of said converging flanges are aligned with and adjacent to respective inner surfaces of diverging ends of slider flanges;

placing inner portions of the end slide fastener stringer sec-

tions, including sections of coupling element trains with respective slider flange engaging means of the slide fastener stringers, on the upper surface of the stringer guiding means;

engaging the slider flange engaging means of the end slide fastener stringer sections with the inner surfaces of the respective guiding means flanges;

simultaneously advancing the end slide fastener stringer sections along the guiding means flanges while maintaining engagement of the slider flange engaging means with the respective guiding means flanges to simultaneously insert the end slide fastener stringer sections into the slider and to interlock the trains of coupling elements on such end slide fastener stringer sections by means of the slider,

lowering the stringer guiding means, and

removing the slider and stringers from the support.

4,293,995

METHOD OF MAKING CAMSHAFT FOR RECIPROCABLE PISTON ENGINES

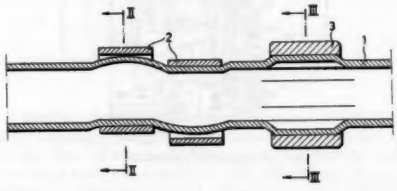
Friedrich Jordan, Kürten, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 898,818, Apr. 21, 1978, abandoned, which is a continuation of Ser. No. 733,071, Oct. 18, 1975, abandoned. This application Oct. 5, 1979, Ser. No. 82,017

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1975, 2546802

Int. Cl.³ B23P *17/00*

U.S. Cl. 29—421 R **2 Claims**



1. A method of making a camshaft having cam and bearing ring members on a hollow shaft with the cam ring members laterally offset relative to the axis of the shaft, which includes placing cam and bearing ring members on the tubular shaft, mounting said members on said tubular shaft in dies to preserve their shape, each of said ring members having in the inner wall thereof at least one recess means extending substantially the length of the member, and expanding said tubular member into said ring members and into said recess means to secure said ring members to said shaft with the cam ring members laterally offset relative to the axis of the shaft.

4,293,996

METHOD FOR SECURING A WHEEL TO A ROTATABLE SHAFT

Carl H. Geary, Jr., Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,428

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—446 **3 Claims**

1. A method of securing a wheel member to a rotatable shaft comprising the steps of:

positioning the wheel member between a piston member and one end of the shaft, with the piston member extending into a chamber defined by the wheel member;

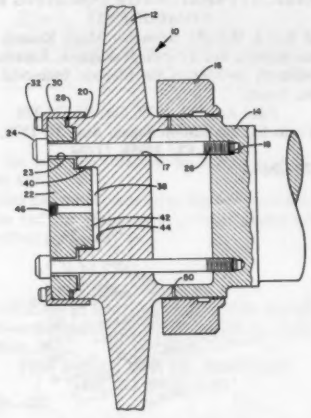
passing a plurality of bolts through aligned apertures defined by the piston member and wheel member and into holes defined by the shaft;

securing a first end of each bolt to the shaft;

attaching a second end of each bolt to the piston member;

delivering a pressurized fluid into the chamber defined by the wheel member to move the piston member relative to the wheel member and form a space therebetween;

stretching the bolts as a result of the movement of the piston member attached thereto; and



placing a spacing member in the space formed between the wheel member and the piston member to place a compressive force on the wheel member for positively securing the wheel member to the shaft.

4,293,997

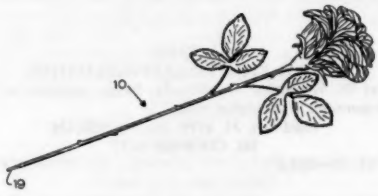
METHOD FOR MANUFACTURE OF ARTIFICIAL FLOWERS

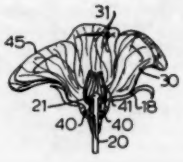
Bobby L. Lee, 5, Mok Cheong St., ground floor, block C, Kowloon, Hong Kong

Division of Ser. No. 925,705, Jul. 18, 1978, which is a continuation-in-part of Ser. No. 790,016, Apr. 22, 1977, abandoned. This application Nov. 14, 1979, Ser. No. 94,174

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—450 **11 Claims**





7. A method for making artificial flowers, comprising:

molding around a reinforcing wire core, as one single inte-

gral plastic unit, a stem with side petioles and flower calyx and attachment means surrounded by said calyx,

securing pre-cut artificial leaves to said petioles, and

attaching a preassembled artificial flower to said attachment means.

4,293,998

AUTOMATIC APPARATUS FOR INSERTING ELECTRIC COMPONENTS

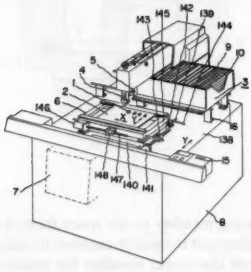
Hidetoshi Kawa, Ibaraki; Kazuhiro Mori, Katano; Yoshihiko Misawa, Katano, and Hiroshi Nakagawa, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 30, 1979, Ser. No. 71,378

Claims priority, application Japan, Aug. 31, 1978, 53-107130

Int. Cl.³ H05K *13/04*

U.S. Cl. 29—564.1 **6 Claims**



1. In an automatic apparatus for inserting electric components into a circuit board, the electric components having a plurality of lead wires which are arranged in two rows in approximately the same direction, the improvement comprising a taking-out chuck unit provided with a pair of forming levers for spreading apart the tip ends of said lead wires in two rows and retaining said lead wires, a driving source for moving the taking-out chuck unit from a component taking-out position, an insertion chuck unit for receiving and retaining the electric components from said taking-out chuck unit delivered by the driving source thereby to insert the electric components into said circuit board, and a component feed portion for sequentially feeding said electric components to the components taking-out position of said taking-out chuck unit.

4,293,999

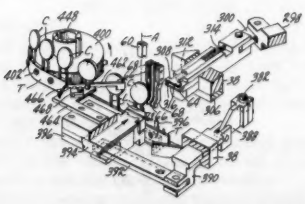
RADIAL LEAD INSERTING MACHINE

Daniel W. Woodman, Jr., Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Oct. 31, 1978, Ser. No. 956,436

Int. Cl.³ H05K *3/32*

U.S. Cl. 29—564.6 **19 Claims**



1. In a machine for inserting the leads of radial-lead type components into a circuit board, a driver cyclically reciprocable toward and from the board, means for feeding successive tape-mounted components into registration with the path of the driver, a pusher operable by the driver yieldingly to accommodate different body shapes and sizes of the components and to urge the leads of each component endwise into the board, cooperative fingers movable to grip and guide the leads of each component while it is acted on by the pusher, and cooperative knives for separating each component from the tape and shearing the leads to be inserted by the pusher while they are under the control of the fingers, means for shifting that portion of the tape holding the excess lead portions out of the path of the component to be inserted and the closed fingers guiding its leads; and means to actuate the fingers and knives in sequence in response to movement of the driver.

4,294,000

MACHINE FOR INSERTING ELECTRONIC COMPONENTS

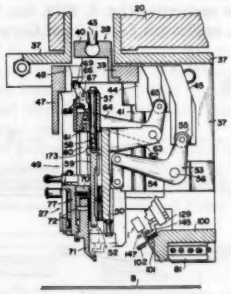
Tetsuo Takahashi; Yoshinobu Taguchi; Kotaro Harigane; Tetsuro Ito, and Akihiro Kato, all of Tokyo, Japan, assignors to Tokyo Denki Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Apr. 27, 1979, Ser. No. 34,014

Claims priority, application Japan, May 2, 1978, 53-53161

Int. Cl.³ H05K *3/32, 13/02*

U.S. Cl. 29—564.6 **15 Claims**



1. In a machine for processing and inserting parallel lead electronic components from an electronic component web carrier into lead receiving openings in a printed circuit board, insert means for receiving an electronic component at a predetermined position and inserting the electronic component into the printed circuit board, said insert means including an insert sub-assembly having

a frame;

first slider means slidably mounted on the frame;

driving means mounted on said frame for driving the first slider means;

second slider means slidably mounted on said frame and cooperating with movement of said first slider means, said second slider means including lead inserting and guiding means for holding and guiding the electronic component and push bar means for displacing the electronic component from the predetermined position to an inserted position under the control of the lead inserting and guiding means;

intermittent drive means;

feed means mounted on said frame and driven by the intermittent drive means for feeding the electronic component web carrier intermittently, pitch by pitch, said feed means including a feed member for receiving and feeding said electronic component web carrier while maintaining electronic components of said electronic component web carrier substantially vertically and a holding member for holding the electronic components in an oblique orientation to the vertical direction;

cutting means for separating one electronic component from

said electronic component web carrier fed by the feed means while the electronic component is being held by said holding member in an oblique orientation; and

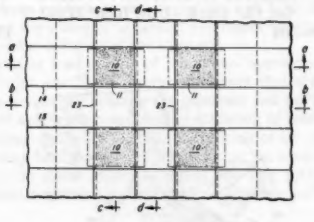
transfer means including reciprocating means for producing reciprocative movements between the cutting means and said lead inserting and guiding means, and electronic component holding means for holding a lead of the electronic component to be separated by said cutting means while the electronic component is being held by said holding member in an oblique orientation and transferring said electronic component to said lead inserting and guiding means after said electronic component has been separated by said cutting means whereupon the transferred electronic component is situated in a substantially vertical orientation.

4,294,001

METHOD OF MAKING IMPLANT PROGRAMMABLE METAL GATE MOS READ ONLY MEMORY

Chang-Kiang Kuo, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 8, 1979, Ser. No. 1,571
Int. Cl.³ H01L *21/425*
U.S. Cl. 29—571 **10 Claims**



1. A method of making a read-only-memory comprising the steps of: forming a plurality of insulated gate field effect transistors in a face of a semiconductor body, each of the transistors having a source, a drain and a polysilicon gate, the transistors being in a regular pattern to provide an array of memory cells; applying a plurality of parallel polysilicon strips each including a plurality of said gates extending along said face with a metal layer over each strip except over the gates so the polysilicon of each gate is not covered by metal; and thereafter programming the array of memory cells by masked ion implant penetrating through the gates of selected ones but not all of the field effect transistors.

4,294,002

MAKING A SHORT-CHANNEL FET

Chakrapani G. Jambotkar, Hopewell Junction, and Paul P. Wang, Kingston, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

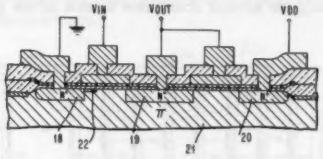
Filed May 21, 1979, Ser. No. 41,023
Int. Cl.³ H01L *21/26*
U.S. Cl. 29—571 **8 Claims**

1. A method for forming a field effect transistor which comprises:

(a) ion-implanting an impurity of one conductivity type into two areas on a major face of a second conductivity type substrate of substantially low conductivity to a first depth to form two closed, spaced regions of one conductivity type to function as the source and drain of the field effect transistor;

(b) ion implanting an impurity of the second conductivity type into a third area including at least a portion of the first of said two areas and a portion of the area between the two regions to a second depth which is only a small fraction of the first depth to form a third region of the said second conductivity type adjacent to the first of the said two regions but spaced from the second of the two said regions to function as the effective channel of the field effect transistor;

(c) forming a gate for the field effect transistor insulated



from the said low conductivity substrate over the third region; and

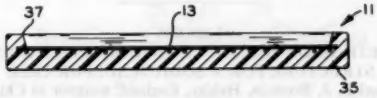
(d) forming electrical contacts to the said two closed spaced regions and the said gate to provide connections to the field effect transistor.

4,294,003

INSULATED RADIANT HEATING PANEL

Don A. Coverstone, Larwill, Ind., assignor to Lyall Electric, Inc., Albion, Ind.

Filed Dec. 13, 1979, Ser. No. 103,190
Int. Cl.³ H05B *3/00*
U.S. Cl. 29—611 **9 Claims**



1. The method of forming a radiant heating panel comprising the steps of:

selecting a relatively flat metal heat-radiating plate having a first generally planar surface for forming a front surface of the panel;

adhering an electrically insulated sheet heating element to a second generally planar surface of the metal plate opposite the first surface;

embedding the metal plate and adhering heating element in a flowable material to cover the heating element and the plate edges about substantially the entire periphery of the plate while leaving the plate front surface substantially material free; and

solidifying the flowable material to form an electrically and thermally insulating frame for supporting the plate and heating element.

4,294,004

METHOD OF ASSEMBLING A SWITCH AND TERMINAL ASSEMBLY

James P. Frank, Rock Falls, Ill., assignor to General Electric Company, Fort Wayne, Ind.

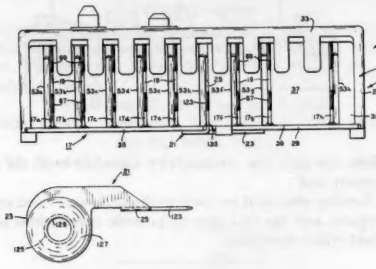
Division of Ser. No. 671,965, Mar. 30, 1976, Pat. No. 4,095,073. This application Mar. 6, 1978, Ser. No. 884,097
Int. Cl.³ H01H *11/00, 11/04, 9/12*
U.S. Cl. 29—622 **31 Claims**

1. A method of assembling a switch and terminal assembly having a casing including a pair of casing members, a switch means accommodating chamber within the casing, a plurality of terminals respectively having electrical connector sections, and a ground device having a ground connection section and another section, the method comprising the steps of:

disposing the terminals in one of the casing members with the electrical connection sections of the terminals exposed

beyond the casing and arranged generally in row formation therealong;

positioning the other of the casing members with respect to the one casing member and the terminals so as to generally enclose the chamber within the casing and retain the terminals against displacement therefrom; and thereafter disposing the ground connection section of the grounding



device generally in the row formation with the electrical connection sections of the terminals and inserting the another section of the grounding device from exteriorly of the enclosed casing through one of the one and other casing members into releasable gripping engagement with the other of the one and other casing members so as to at least in part oppose the separation thereof and the displacement of the grounding device from the casing.

4,294,005

METHOD OF FORMING CATHODIC ELECTRODE STRUCTURE FOR A SODIUM SULFUR CELL

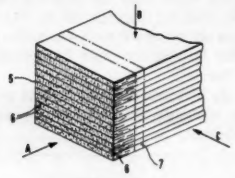
Michael P. J. Brennan, Helsby, England, assignor to Chloride Silent Power Limited, London, England

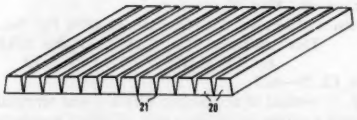
Continuation-in-part of Ser. No. 861,924, Dec. 19, 1977, Pat. No. 4,176,447. This application May 23, 1979, Ser. No. 41,380

Claims priority, application United Kingdom, Dec. 20, 1976, 53197/76; Australia, Feb. 6, 1979, 43990/79; India, Feb. 6, 1979, 87/DEL/79; South Africa, Feb. 6, 1979, 79/0504; European Pat. Off., Feb. 13, 1979, 7930214.8; Japan, Feb. 13, 1979, 54-15371; United Kingdom, Feb. 13, 1979, 04968/79

Int. Cl.³ H01M *4/04*

U.S. Cl. 29—623.5 **5 Claims**





1. In the manufacture of a sodium sulphur cell, a method of forming a cathodic electrode structure comprising the steps of forming a compressible block of electronically conductive fibrous material which is chemically resistant to a hot cathodic reactant containing sulphur/polysulphides, the fibres in the block predominantly extending parallel to a given plane in the block and being randomly oriented in said plane, cutting the block in a plurality of planes normal to said one plane to form at least one sheet in which substantially all of the fibres have a component of direction normal to the plane of the sheet, compressing the sheet in a direction normal to the plane of the sheet in a series of regions defined by parallel strips of the sheet surface to form a series of parallel grooves with sloping sides defining segments of trapezoidal section between the compressed regions with fibres lying normal to the parallel surfaces of the trapezoids between the compressed regions, impregnating the fibrous sheet, either before compression or during compression, with the cathodic reactant at a temperature such that the cathodic reactant is liquid, and cooling the impregnated shape to solidify the reactant.

4,294,006

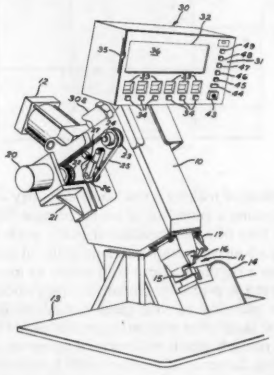
AUTOMATIC CONTROL FOR WIRE CRIMPING MACHINE

Eugene C. Bair, and Willard C. Hopkins, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed Oct. 18, 1979, Ser. No. 86,000

Int. Cl.³ H01R *43/04*; B23P *21/00*

U.S. Cl. 29—701 **17 Claims**



1. Automatic control apparatus for wire crimping equipment adapted to make, during a crimp cycle having one or more crimp steps, electrical interconnections with one or more magnet wire segments extending from windings supported on the core of a dynamoelectric machine, the equipment having a crimp height setting mechanism which is substantially infinitely variable over a predetermined range of maximum and minimum height limits, the control apparatus comprising:

first input means for establishing the number of crimp steps to be performed and for generating a signal representative of each step;

second input means for establishing any desired crimp height setting, within said range of maximum and minimum limits, for each crimp step to be performed and for generating a signal representative thereof;

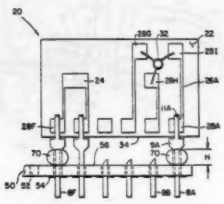
means operative in response to the first and second input means during each crimp step for actuating the crimp height setting mechanism to the setting established for that step;

and crimp actuating means for initiating a crimp operation at each crimp step after the crimp height mechanism has been properly positioned to the corresponding crimp height setting.

4,294,007
METHOD OF MOUNTING THICK FILM HYBRID CIRCUITS IN PRINTED CIRCUIT BOARDS

Paul R. Ellis, Jr., Alburquerque, N. Mex., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Division of Ser. No. 417, Jan. 2, 1979, Pat. No. 4,257,668. This application Dec. 31, 1979, Ser. No. 108,624
Int. Cl.³ H05K *3/36*
U.S. Cl. 29—830 **7 Claims**



1. In a method of fabricating an electrical circuit assembly including a hybrid circuit having flexible terminal leads that depend from a substrate and extend through holes in a mother board and are soldered to conductive traces on the board, the improvement comprising the steps of:

inserting at least a pair of leads into apertures extending through associated fracturable beads that are relatively non-porous for spacing the substrate and portions of the leads above the board during soldering of leads to traces,

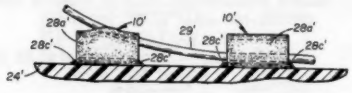
fracturing the beads following soldering of the board, and

removing bead parts from leads so that the leaded substrate may be tilted generally about the line intersection of planes containing surfaces of the substrate and the board.

4,294,008
METHODS OF MANUFACTURING AND SECURING TUBULAR WIRE-RETAINING ANCHORS TO CIRCUIT BOARDS

Frank J. Pollack, Naperville, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 27, 1979, Ser. No. 52,655
Int. Cl.³ H05K *3/20*
U.S. Cl. 29—831 **7 Claims**



1. A method of forming discrete circuit wiring on a circuit board including securing a tubular-shaped anchor having an outer wall surface of continuously arcuate profile in the circumferential direction, and adapted to retain an elongated element therewithin, on a circuit board, comprising the steps of:

applying a viscous portion of adhesive on the surface of said circuit board at a desired anchor location, said viscous portion comprising the second part of a two-part adhesive, with the first part being initially applied at least to a portion of the outer arcuate wall surface of said anchor, and being of a type that readily dries as a non-tacky coating at ambient temperature, and which requires no protective covering prior to said anchor being brought into contact with the second part adhesive portion;

positioning said tubular anchor in said second part adhesive portion such that a solidified adhesive bond is formed on opposite sides of the contact juncture between a portion of the arcuate wall surface of said anchor and said circuit board, at which time the second part adhesive portion rapidly solidifies to form a fillet-shaped bond between said anchor and circuit board;

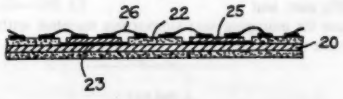
threading a section of at least one elongated element, in the form of a wire, through said anchor so as to secure the threaded section of wire to said circuit board, and

connecting opposite ends of said wire to spaced conductive sites on said board.

4,294,009
METHOD OF MANUFACTURING A HYBRID INTEGRATED CIRCUIT

Renee Quintin, Houdan, and Claude M. Villemant, Paris, both of France, assignors to Le Material Telephonique, Boulogne-Billancourt, France

Filed Jun. 28, 1979, Ser. No. 52,932
Claims priority, application France, Jun. 29, 1978, 78 19509
Int. Cl.³ H05K *3/32*
U.S. Cl. 29—832 **8 Claims**



1. A method of manufacturing a hybrid integrated circuit having on a substrate passive components, such as resistors and capacitors deposited in the form of thin or thick films, and active components, such as diodes, transistors and monolithic integrated circuits, connected together by means of an interconnection network, comprising the steps of:

(a) selecting a steel plate of a size corresponding to the circuit to be manufactured;

(b) preparing the surfaces of the steel plate to receive a coat of enamel which can be bonded to and vitrified on steel;

(c) masking selected areas of the plate by the local application of a coat of thermally decomposable or volatilizable material;

(d) coating the surfaces of the plate and mask with an even layer of an enamel composition which can be vitrified on steel;

(e) drying the enamel coating while leaving the masking intact;

(f) removing the dried enamel deposited over the masking;

(g) thermally treating the plate in order to bond the dried enamel coating on the steel, and for volatilizing or burning the masking material on the masked areas, thus forming a dielectric enamel layer, and baring of the masked areas;

(h) forming on selected portions of the bared areas of the plate a solderable and electrically conducting metallic film;

(i) forming passive components and an interconnection network on the continuous layer of dielectric enamel using techniques of depositing inks or pastes followed by baking;

(j) fixing monolithic integrated circuits to the previously metallized areas of the plate, and;

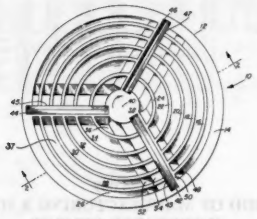
(k) electrically connecting the monolithic circuits to the interconnection network by means of metallic conductors.

4,294,010

ROTATABLE SAFETY RAZOR AND BLADE CARTRIDGE THEREFOR

Evan N. Chen, Fairfield, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 23, 1980, Ser. No. 152,901
Int. Cl.[3] B26B *19/14*
U.S. Cl. 30—42 19 Claims



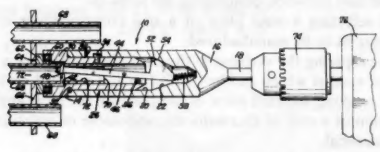
1. A rotatable safety razor cartridge comprising:
a circular blade supporting member;
a plurality of arcuate grooves concentrically formed in said supporting member about a central axis, said grooves forming a plurality of concentric skin-engaging lands;
at least one razor blade connected to said supporting member and extending through said plurality of grooves and lands with a cutting edge positioned for engaging the skin of a user; and
means for engaging said supporting member with a rotary drive mechanism.

4,294,011

TUBE CUTTER

Wendell J. Kemme, Redlands, Calif., assignor to T/Drill, Inc., Ann Arbor, Mich.

Filed Jun. 18, 1979, Ser. No. 49,398
Int. Cl.[3] B23D *21/06;* B26B *27/00*
U.S. Cl. 30—106 4 Claims



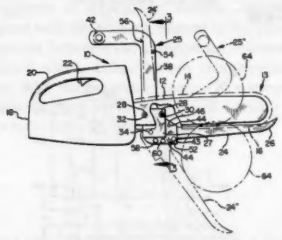
1. A cutter apparatus for cutting tubes a fixed distance outward from a support wall, said cutter apparatus comprising:
a cylindrical housing having an open end, an interior cam surface, and a closed end;
connecting means located on said closed end of said housing for receipt of drive means for rotating said housing;
a hollow tubular coupling having one end slidably mounted within said open end of said housing and the other end having a central bore to closely receive one of said tubes, said coupling being slidably movable between a first position and a second position relative to said housing;
an elongated arm pivotally mounted on said coupling within said coupling and said housing;
a cutter wheel attached to one end of said arm;
a cam follower on said arm engageable with said cam surface such that relative sliding movement between said housing and said coupling pivots said arm; and
a removable bushing connected to said coupling to provide the selective attachment of variable length bushings for positioning said cutter wheel a predetermined fixed distance from said support wall.

4,294,012

CHAIN SAW ANTI-PINCH GUARD ARM

Donald D. Lanz, 15702 S. Neibur Rd., Oregon City, Oreg. 97045

Filed Mar. 25, 1980, Ser. No. 133,915
Int. Cl.[3] B27B *17/00*
U.S. Cl. 30—378 20 Claims



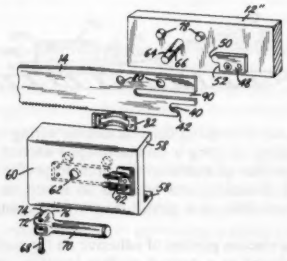
1. In combination with a chain saw having an outwardly projecting blade mounting a saw chain having a working stretch, an antipinch guard attachment comprising:
(a) a stiff arm of substantial strength;
(b) pivotal mounting means mounting on one end of the arm on the saw adjacent to the base of the blade in a plane substantially parallel to the plane of the blade, the arm thereby being pivotal between an initial angular position wherein it extends divergently to the working stretch of the saw chain and a second angular position wherein it is adjacent and substantially aligned with the working stretch of the saw chain; and
(c) elongated handle means attached to the arm for adjustment angularly relative thereto and for pivotal movement therewith.

4,294,013

PORTABLE HACKSAW

Adrian H. Krieg, Woodbridge, Conn., assignor to Widder Corporation, Naugatuck, Conn.

Filed Feb. 25, 1980, Ser. No. 124,448
Int. Cl.[3] B27B *11/00*
U.S. Cl. 30—392 15 Claims

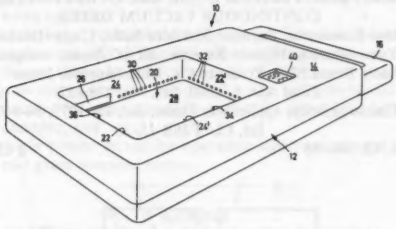


3. In a hacksaw having a body, a motor and a shaft connected to the motor for reciprocating motion, the combination of a blade connected to the shaft, said blade having a haft with a rear surface, said rear surface being cut away, the cut away portion being defined by a line continuing in the long direction of said blade which line at the terminal end of its travel defines a female recess and a wall generally parallel to and spaced inwardly from the rear surface of said haft, cooperating means on said shaft for abutting said recess and said wall in supporting relationship, and means for securing said blade and shaft together.

4,294,014
APPARATUS FOR DETERMINING THE SHOE SIZE CORRESPONDING TO A FOOT

Dieter Baumann, Leun-Stockhausen, Fed. Rep. of Germany, and Pierre Bidegain, Pau, France, assignors to Bidegain S.A., Pau, France

Filed Mar. 27, 1980, Ser. No. 134,633
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2912038
Int. Cl.³ A43D *1/02*
U.S. Cl. 33—3 C **38 Claims**



1. In an apparatus for determining the shoe size corresponding to a foot, said apparatus being of the type having a foot holding device, at least one transmitting unit which radiates spatially bunched signals to a receiving unit opposite the foot holding device, the transmitting unit being subdivided into radiating basic elements and the receiving unit into basic elements responding to the signals, pairs of respective radiating and responding basic elements being in opposed, spaced relationship with basic elements of the same type being arranged side by side in the direction of successive, spaced measuring raster points, the improvement comprising:

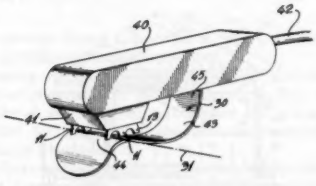
the extension of said basic elements in the direction of successive measuring raster points being no greater than the spacing of adjacent measuring raster points; and

at least within adjacent pairs of basic elements, the two basic elements defining each of said pairs being in one to one correlation with each other regarding the signals to be transmitted.

4,294,015
EXTENSOMETER

Gilbert Drouin, L'Acadie, and Jacques Sibille, Beloeil, both of Canada, assignors to Ecole Polytechnique, Quebec, Canada

Filed Dec. 27, 1979, Ser. No. 107,574
Int. Cl.³ G01B *7/16*
U.S. Cl. 33—174 D **9 Claims**



1. An extensometer for detecting deformation of a biological elongatable member to be stretched, said extensometer comprising:

a support base;

a pair of spaced-apart flexible plates;

a strain gauge secured to each of said flexible plates for measuring deflection of said flexible plates, from the normal plane of said flexible plates;

said flexible plates each further comprising a free end and an opposed end, said opposed end secured to said support base;

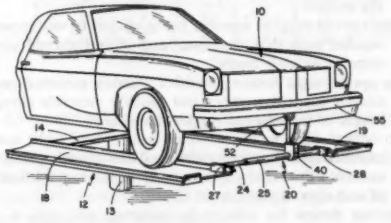
said free end further comprising gripping means for engagement in a surface portion of said elongatable member; and

clamping means for applying a force perpendicular to said elongatable member positioned opposite said gripping means of said pair of flexible plates to cause said gripping means to positively engage in said surface portion of said elongatable member, said clamping means being secured to said support base for maintaining said support base substantially stationary with respect to said elongatable member such that elongation of said elongatable member is detected by flexion of said flexible plates.

4,294,016
AUTOMOBILE HEIGHT GAUGE

Edward D. Wilkerson, P.O. Box 755 South Ct., Normandy Beach, N.J. 08739

Continuation of Ser. No. 731,061, Oct. 8, 1976, abandoned, which is a continuation of Ser. No. 573,816, May 2, 1975, abandoned. This application Aug. 16, 1977, Ser. No. 825,023
Int. Cl.³ G01B *3/02*
U.S. Cl. 33—180 AT **2 Claims**



1. In a height gauge for measuring the vertical distance between a vehicle tire support tread and certain selectable parts of a vehicle, and in which the vehicle may be either ground supported or it may be lift supported by a lift which has a pair of separated tire tread engaging supports with each support formed with an upwardly projecting tire guide element, and in which the gauge has an elongated horizontal bar member, a measuring tape cartridge frame mounted for movement along said bar member, coiled tape means in said frame, a magnet carried by the end of said tape means and window means in said frame positioned so that the numerical calibration reads directly the distance from the end of the magnet to the vehicle tire support tread, the improvement comprising a fitting fixed to each end of said bar member and each individually adapted to fit over a guide element or to rest on any vehicle ground support surface, each of said fittings being U-shaped in configuration with at least one leg of the U-shaped fitting being engageable with a vehicle ground support surface or with the tire tread engaging support surface of the lift so that the height gauge measures height from the vehicle tire support tread as a reference and in which the fittings are formed with sufficient clearance so that the bight portion of each does not engage an associated lift tire guide element, and in which both legs of each fitting extend below the elongated horizontal bar member.

4,294,017

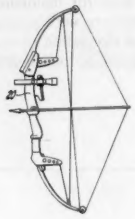
ARCHERY SIGHTING DEVICE AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Robert J. Byrnes, 4366 Genesee Rd., and Bruce R. Byrnes, 937 N. Monroe St., Apt. 4, both of Lapeer, Mich. 48446

Continuation-in-part of Ser. No. 935,667, Sep. 19, 1978. This application Mar. 31, 1980, Ser. No. 135,654

Int. Cl.³ F41G *1/46*

U.S. Cl. 33—265 **5 Claims**



1. An archery sighting device comprising:

a mounting bracket;

first means for affixing said mounting bracket to the midsection of an archery bow;

a curved elongated support member directly rigidly affixed along a portion of the length thereof to said mounting bracket such that the curve thereof is concave relative to the archer when said mounting bracket is affixed to said archery bow;

said curved support member having a radius of curvature which is substantially proportional to the draw length of the archer;

said curved support member being affixed to said mounting bracket such that the lower end of said curved support member extends freely;

an optical sight housing member slidably mounted on said curved support member and slidably movable along the length of said curved support member;

an optical sight mounted within said optical sight housing member such that the longitudinal axis of said optical sight extends substantially transversely to the longitudinal axis of said curved support member;

second means for selectively securing said optical sight housing member at any desired position along the length of said curved support member;

third means operatively cooperating with said second means, said curved support member, and said optical sight housing member for defining detent positions of said optical sight housing member at selectively-predetermined locations along the length of said curved support member;

said curved support member being provided with a dovetail portion along the length thereof;

said optical sight housing member being provided with a dovetail mating portion received by said dovetail portion of said curved support member to permit said housing member to be slidably moved along the length of said curved support member;

said second means comprising a locking screw member extending through said optical sight housing member and adapted to secure said optical sight housing at a predetermined position along the length of said curved support member when said locking screw member is rotated to a locked position; and

wherein said third means comprises:

at least one detent positioning block provided with a detent tooth and adapted to be slidably received within said dovetail portion of said curved support member;

fastening means for selectively securing said detent positioning block at any desired fixed position within said dovetail portion of said curved support member;

a spring-biased lever operatively disposed within said optical sight housing member, said lever including a detent projection portion; and

said lever being selectively movable between a first position wherein said detent projection is in locking engagement with said detent tooth of said detent positioning block, and a second position wherein said detent projection is disengaged from said detent tooth of said detent positioning block.

4,294,018

MATERIAL FEED PIPE FOR USE IN BELT-SYSTEM CONTINUOUS VACUUM DRIER

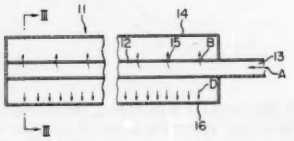
Eitaro Kumazawa, Sayama; Yukihiro Saiki, Oaza-Hidaka, and Yozo Ishioka, Higashi-Kurume, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan

Filed Apr. 9, 1980, Ser. No. 138,812

Claims priority, application Japan, Jul. 25, 1979, 54-94731

Int. Cl.³ F26B *15/10*

U.S. Cl. 34—56 **2 Claims**



1. A material feed pipe for use in a belt-system continuous vacuum drier and oriented above a belt movably mounted within a vacuum drying chamber, comprising: an inner tube member having one end thereof provided with an inlet for material and the other end closed; an outer tube member coaxial with said inner tube and having its two ends closed and encircling said inner tube member and being radially spaced therefrom; a plurality of first nozzle openings provided in an upper part of said inner tube member and oriented at a fixed pitch along the axial length thereof, said first nozzle openings being so devised as to have a larger diameter in regular succession from the inlet end to the opposite end of said inner tube member; and a plurality of second nozzle openings provided in a lower part of said outer tube member and at a fixed pitch along the axial length thereof and having a fixed diameter.

4,294,019

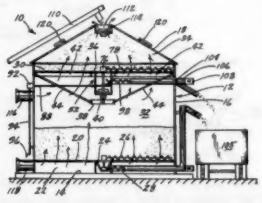
GRAIN DRYING APPARATUS

Vernon H. Seitmann, Laurel, Iowa 50141

Filed May 7, 1979, Ser. No. 36,382

Int. Cl.³ F26B *9/02*

U.S. Cl. 34—65 **16 Claims**



1. An apparatus for drying grain comprising,

a grain bin having a bottom surface, sidewall and top wall,

a perforated cooling floor supported in said bin in spaced relation from said bottom surface to define an ambient air supply chamber between said bottom surface and cooling floor,

a perforated drying floor supported in said bin and spaced substantially above said cooling floor to define a cooling

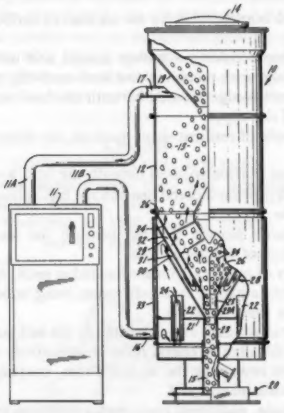
chamber between said cooling floor and drying floor and a drying chamber between said drying floor and top wall,
said top wall having an opening for the introduction of grain into said drying chamber and said drying floor having an opening therethrough,
a grain hopper supported below said drying floor in communication with said drying floor opening,
a grain discharge conveyor having one end in communication with said hopper and the other end extended outwardly through said sidewall,
said hopper including a gate means adapted to confine grain within said hopper when closed and adapted to permit grain to fall from the hopper into the cooling chamber when opened,
a sweep auger positioned on said drying floor and operative to traverse said drying floor for conveying grain to said hopper through said drying floor opening,
a grain spreader means positioned below said gate means for distributing grain generally uniformly about said cooling chamber, and
a single power means for operating said sweep auger and said grain spreader means.

4,294,020

PLENUM DRYING HOPPER WITH INTEGRAL HEATERS

Arthur J. Evans, Northville, Mich., assignor to Whitlock, Inc., Farmington, Mich.

Filed May 9, 1980, Ser. No. 148,517
Int. Cl.³ F26B *17/14*
U.S. Cl. 34—168 **4 Claims**



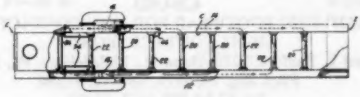
1. A plenum drying hopper for reducing the moisture content of granular material, comprising:
a housing enclosing a plenum chamber and including an upper material inlet for introducing a flow of granular material into the plenum chamber and a lower material outlet for discharging the granular material from the plenum chamber;
a perforate diffuser cone, at the bottom of the plenum chamber, for directing the flow of granular material from the plenum chamber into the material outlet, the perforations in the diffuser cone being large enough to permit ready passage of gas therethrough and small enough to preclude passage of all but the finest particles of the granular material;
a gas inlet, extending into the housing below the diffuser cone, for introducing dry gas into the plenum chamber through the diffuser cone;
a gas outlet, extending from the upper portion of the housing, for discharging gas from the housing after contact with the granular material flowing through the plenum chamber;
a separator barrier positioned between the gas inlet and the diffuser cone;
a plurality of gas passages extending through the separator barrier;
a plurality of heaters, one in each gas passage, for heating gas flowing from the gas inlet th ough such passages toward the diffuser cone; and
deflection shield means, mounted in the lower portion of the housing, between the heaters and the diffuser cone, for deflecting heated gas along a labyrinthine path from the heaters into the plenum chamber through the diffuser cone, shielding the diffuser cone from the heaters to prevent radiant heat from reaching the diffuser cone and deflecting any fine particles of the granular material that pass through the diffuser cone into the material outlet.

4,294,021

METHOD AND APPARATUS FOR CURING OF ARTICLES

James O. Turnbull; John C. Barker, both of Cowansville, and Arthur J. Knight, Bromont, all of Canada, assignors to J. J. Barker Company Limited, Cowansville, Canada

Filed Apr. 5, 1979, Ser. No. 27,914
Int. Cl.³ F26B *15/12*
U.S. Cl. 34—224 **6 Claims**



1. An apparatus for curing wet resin coated articles comprising:
a curing chamber, said chamber having a longitudinal direction between inlet and exit openings, said chamber substantially horizontal and hermetically sealed with the exception of said openings;
conveyor means for transporting said articles through said chamber, said conveyor means passing into the inlet opening and out of the exit opening;
at least one supply duct extending parallel to the direction of travel of articles on said conveyor;
a plurality of distribution members, said distribution members extending transversely with respect to the direction of travel of articles on said conveyor means, said distribution members in fluid communication with said supply ducts, said distribution members including a plurality of jet forming nozzles thereon;
vaporous curing agent withdrawal means, associated with said chamber and located between a midpoint of said chamber and said exit opening, for withdrawing a vaporous curing agent from said chamber;
said jet forming nozzles when said supply duct is supplied with a vaporous curing agent, providing a jet of vaporous curing agent forming an acute angle to the vertical, said jet having a component towards said withdrawal means, said nozzles in combination with said vaporous curing agent withdrawal means comprising the sole means for inducing a dynamic flow over the articles to be cured towards said withdrawal means and away from said openings; and
means for recirculating the vaporous curing agent passing into said withdrawal means through said supply duct.

4,294,022

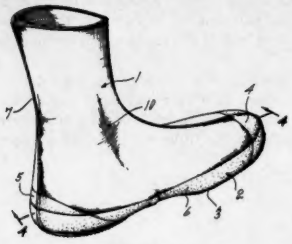
BOOTS FOR AQUATIC ACTIVITIES

Andre Stockli, 2086 Prieur St.; Fernando Castaneda, 7838 Casgrain St., both of Montreal, Quebec, and Jean-Louis Stockli, 3112 Gerard St., Fabreville, Quebec, all of Canada

Continuation of Ser. No. 922,070, Jul. 5, 1978, abandoned. This application Dec. 7, 1979, Ser. No. 101,214

Int. Cl.³ A43B *1/02, 1/10*

U.S. Cl. 36—4 **9 Claims**



1. A boot useful in aquatic activities, particularly in underwater diving, comprising a sock made of a cellular elastomeric material and including an insole and an upper; an outsole assembly consisting substantially of a non-cellular rubber composition covering the insole and the adjacent part of the upper all around the insole, said outsole assembly being vulcanized in situ and adhering to the sock.

4,294,023

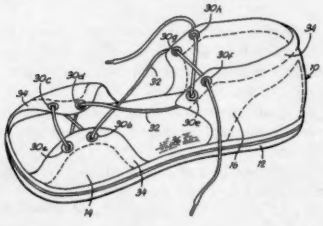
ATHLETIC FOOTWEAR FOR NON-CONTACT OR LIGHT CONTACT SPORTS

Samuel E. Banford, 5226 Akron St., Philadelphia, Pa. 19124

Filed Aug. 16, 1979, Ser. No. 67,198

Int. Cl.³ A43B *3/12, 11/00*

U.S. Cl. 36—11.5 **4 Claims**



1. An athletic shoe characterized by members which are in contact with and which reinforce the wearer's foot at points of maximum flexibility only and which athletic shoe is otherwise unrestricting as to the wearer's foot, comprising first means to protect the sole of the wearer's foot from direct contact with a playing surface, said first means comprising a readily yieldable elastic sole portion member extending essentially the entire length and width of the wearer's foot and conforming to the natural configuration of the sole of said foot; second and third means independently attached to said first means, said second means further comprising two generally tabular shaped members configured to restrainedly encompass the wearer around the ankle and remain in close restraining relationship therewith to thereby reinforce and protect the maximum stress points of the wearer's ankle whereby said first and second means acting in conjunction with one another to minimize any shifting of the heel of the wearer relative to said first means while permitting the wearer to move the ankle in a manner which is independent of and unconstrained by said third means, and said third means further comprising two generally tabular shaped members configured to restrainedly encompass the wearer only above the ball of the foot and remain in close restraining relationship therewith so as to thereby reinforce and protect said ball of the foot whereby said first and third means acting in conjunction with one another permit the wearer's foot to flex across the ball portion thereof in a manner which is independent of and unconstrained by said second means while precluding the foot from shifting forward relative to said first means.

4,294,024

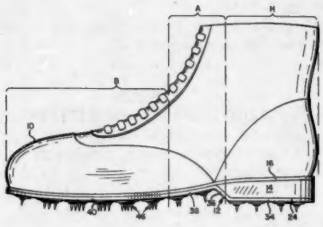
SOLE FOR LOGGING BOOT

Joseph J. Nab, 265 Orange St., Ashland, Oreg. 97520

Filed Sep. 27, 1978, Ser. No. 946,342

Int. Cl.³ A43B *3/00;* **A43C** *15/00*

U.S. Cl. 36—113 **17 Claims**



1. A work boot suitable for use on uneven surfaces comprising:

a boot upper having a lasting margin and including ball-receiving, arch-receiving and heel-receiving portions;

a rigid heel wedge secured beneath the heel-receiving portion of the upper;

an outersole of resilient sheet material, the outersole including:

a. a heel portion secured beneath the heel wedge,

b. a ball portion secured beneath the ball-receiving portion of the upper, and

c. an arch portion secured beneath the arch-receiving portion of the upper; and

a plurality of metal calk means located in each portion of the outersole, a part of each calk means being imbedded in the resilient sheet material;

a number of the calk means located in the ball portion of the outersole being in lateral rows consecutively including:

a. a first row, near the wearer's toes, containing at least one calk means, and

b. multiple, additional rows each containing at least three calk means, the rows being spaced apart a sufficient distance that an uninterrupted, substantially straight, flexible band of the resilient sheet material extends transversely across the entire width of the outersole, substantially parallel to a line through the metatarsal phalangeal joints of the wearer's foot, between the imbedded parts of the calk means of adjacent rows so that the outersole is longitudinally flexible along an axis which is normal to the bands in a region defined by the rows to urge the wearer's foot to move orthopedically correctly.

4,294,025

SOLE ATTACHMENT FOR FACILITATING WALKING

Andre Keller, Vira, Switzerland, assignor to Roll & Go AG, Stansstad, Switzerland

Filed Feb. 19, 1980, Ser. No. 121,993

Int. Cl.³ A43B *5/00*

U.S. Cl. 36—132 **14 Claims**

1. A sole attachment for footwear having a footwear sole

and serving for facilitating walking, especially for use with ski boots, comprising:

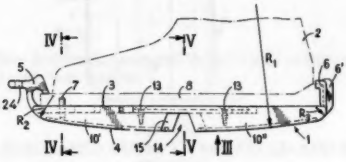
a plate member having an upper surface intended to be applied to the sole of the footwear;

means provided for said plate member for forming a lower tread surface domed in the direction of the sole of the footwear;

attachment devices for securing the plate member at the footwear;

said plate member having opposed ends;

said attachment devices comprising a respective holder element provided at each end of the plate member;



each said holder element engaging over the sole of the footwear;

at least one of the holder elements being formed of one-piece with the plate member;

at least one of the holder elements being structured to be elastically movable between an effectual position for securing the plate member to the footwear and out of such effectual position into an ineffectual position; and

said plate member having an upper surface provided with at least one fixation means intended to be introduced into related recess means provided at the sole of the footwear.

4,294,026

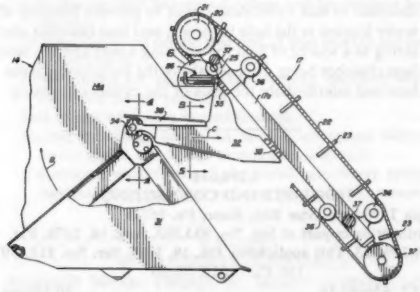
ELEVATING EARTH SCRAPER

James A. Welch, Black Canyon City, Ariz., assignor to Sanner Contracting Co., Phoenix, Ariz.

Filed May 15, 1980, Ser. No. 150,153

Int. Cl.³ E02F *1/00, 9/24*

U.S. Cl. 37—8 **3 Claims**



1. In an earth moving machine for removing topsoil and transporting said soil to another location for unloading and distribution, said earth moving machine including,

a frame,

a primary mover for said earth moving machine mounted in said frame,

a bowl pivotally carried by said frame and having two generally vertical parallel side walls and a scraping edge at the mouth of said bowl for removing topsoil from the ground,

elevator means positioned at said mouth of said bowl to carry said soil from said scraping edge upwardly into said bowl,

ejector floor means movably secured in the bottom of said bowl to upwardly open and release topsoil carried therein,

a pair of ejector floor group members for supporting said ejector floor means, each fixed to and pivotally carried by a respective said bowl wall,

a pair of elevator linkage group members, each adjacent to a respective said bowl wall and interconnecting said elevator means and a respective said ejector floor group member,

the improved elevator linkage group members, said elevator linkage group members being shaped, contoured and dimensioned to generally prevent particles of said soil from lodging between said elevator linkage group members and said respective bowl walls.

4,294,027

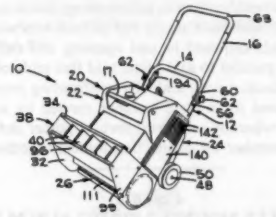
LIGHT WEIGHT SNOW THROWER

Merle L. Edwards, Port Washington, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 26, 1980, Ser. No. 125,000

Int. Cl.³ E01H *5/00*

U.S. Cl. 37—43 R **9 Claims**

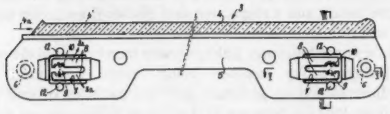


1. A light weight compact snow thrower having an engine; a transversely extending chute; and a transverse impeller driven by the engine: the improvement which comprises means defining a light weight metal frame for supporting the engine and chute; a lower transversely extending handle bar included in said metal frame; an upper handle bar support included in said frame means and extending upwardly and rearwardly relative to the engine; an upper handle bar having a transverse gripping portion; adjustment means releasably securing said upper handle bar to said handle bar support for height adjustment and also for folding the upper handle bar between an operative position extending rearwardly of said engine and a storage position wherein said transverse gripping portion extends forwardly of said engine; a non-metallic engine housing; said engine housing including a lower cover secured to said frame, an upper cover removably secured to said frame and said lower cover, said lower handle bar having an exposed intermediate gripping portion and having end portions projecting within said upper cover, means defining two access openings in said upper cover adjacent said end portions, connector means for removably connecting said end portions to portions of said metal frame enclosed within said housing, and plug means for closing said two access openings after said lower handle bar has been connected to said frame means for minimizing vandalism to said engine.

4,294,028
SUSPENSION-TYPE FILE FOLDER

Jean R. A. Reymond, Grenoble, France, assignor to Etablissements F. Nicollet & Cie Societe Anonyme, Echirolle, France

Filed Jan. 9, 1980, Ser. No. 110,800
Claims priority, application France, Jan. 11, 1979, 79 01181
Int. Cl.[3] B42F *21/00*; A47B *63/00*; B42F *15/00*
U.S. Cl. 40—359 5 Claims



1. A suspension-file folder comprising:

a pair of leaves hingedly interconnected at their bottoms and formed with a pair of horizontal edges and a pair of vertical edges;

suspension rods formed along the upper edges of said leaves and having laterally projecting formations adapted to suspend the folder from a pair of rails; and

an indicating tab fixed to one of said leaves along one of said edges, said indicating tab being molded in a single piece from a transparent synthetic resin material and comprising:

an elongated tubular portion extending along said one of said edges and adapted to receive an identifying label for said folder,

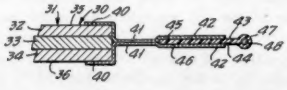
a plate formed unitarily with said tubular portion and overlying a face of one of said leaves, said plate being provided with at least one opening, and

a pair of arms disposed in said opening and molded unitarily with said plate at one end of each arm while having free ends disposed in said opening and deflectable in planes parallel to said plate, said free ends of said arms being formed with mutually confronting recesses forming a seat for a male member carried by an adjacent folder whereby said arms form a pincer defining a female member for connecting folders together.

4,294,029
PIVOTALLY MOUNTED PHOTO ALBUM PAGE

Sheldon Holson, Wilton, Conn., assignor to The Holson Company, Wilton, Conn.

Filed Jun. 19, 1980, Ser. No. 161,213
Int. Cl.[3] B42F *17/00*
U.S. Cl. 40—388 2 Claims

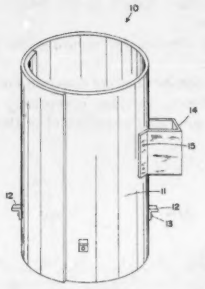


1. In a pivotally mounted photo album page of a type including a planar page element having a rectilinear edge, and means for engaging said edge forming a hinged interconnection with a binder, said means including a wire segment lying in the plane of said page element having free ends projecting laterally of said page element, the improvement in said last-mentioned means comprising: a generally planar channel forming element including a body of extruded synthetic resinous material having first and second opposed surfaces and a rectilinear hollow beaded edge defining a cylindrical channel therein, said wire being disposed in said channel to be frictionally retained thereby; and first and second adhesive tape strips, each strip interconnecting a surface of said page element with a surface of the body.

4,294,030
ICE HOLE HEATER

James W. Stewart, 1104 Norton, St. Paul, Minn. 55117

Filed May 1, 1980, Ser. No. 145,427
Int. Cl.[3] F23B *3/00*
U.S. Cl. 43—4 1 Claim



1. An ice fishing device operable for fishing therethrough comprising:

a cylindrical sleeve having a top and a bottom, said cylindrical sleeve having a pair of ends that overlap each other to define a cylindrical shape having an interior surface and an exterior surface, said cylindrical sleeve made from a resilient material so that radial compression of said cylindrical sleeve produces a force to restore said cylindrical sleeve to its original shape, said cylindrical sleeve having an unobstructed passage therethrough to permit one to pull a fish therethrough without displacing said cylindrical sleeve;

ice gripping members located adjacent but spaced from the bottom of said cylindrical sleeve, said ice gripping members coacting with said cylindrical sleeve to permit a user to position the bottom of said ice fishing device in a hole in the ice; and

a heat chamber attached to exterior surface of said cylindrical sleeve so that when said cylindrical device is positioned in the ice said heat chamber is remotely located from a fishing line to permit heat transfer from said heat chamber to said cylindrical sleeve to prevent freezing of water located in the hole in the ice, said heat chamber also acting as a source of heat for warming a user's hands, said heat chamber being disposed above the ice gripping members and intermediate the ends of the cylindrical sleeve.

4,294,031
HOOK-STRAND CONNECTING

Joseph T. Manno, Star Rte., Kane, Pa. 16735

Continuation-in-part of Ser. No. 933,503, Aug. 14, 1978, Pat. No. 4,209,933. This application Jan. 18, 1980, Ser. No. 113,379
Int. Cl.[3] A01K *83/00*
U.S. Cl. 43—43.16 10 Claims

1. An integral structure for ready attachment to a strand, said structure consisting essentially of:

a first end forming a hook;

a second end forming a strand receiving portion;

a middle portion between said first and second ends; and

a generally T-shaped projection means formed from said middle portion for friction wrapping of a strand to said structure, said projection means consisting of a cross portion of the T spaced from and generally parallel to said middle portion, and a leg portion of the T interconnecting said cross portion to said middle portion, said leg portion being relatively short compared to the thickness of a

strand to be received thereby so that a strand may be wrapped around said leg portion one or more times and be

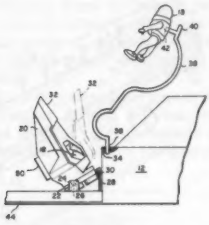
tightly frictionally engaged by both said middle portion and said cross portion.

4,294,032

TOY SIMULATED ROCKET PROPELLED AIRCRAFT SYSTEM

Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Jan. 22, 1980, Ser. No. 114,279
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—1 R **10 Claims**



1. A toy simulated rocket propelled aircraft system comprising in combination:
- a mother aircraft having a fuselage and an opening leading therein;
- a rocket mounted on the rear end of said mother aircraft for propelling it;
- cover means for said fuselage opening movable between open and closed positions;
- first mounting means in said fuselage;
- second mounting means on said cover means when said cover means are in said closed position; and
- a miniature rocket propelled aircraft selectively releasably mountable on said first and second mounting means.

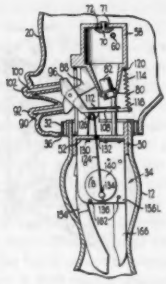
4,294,033

ANIMATED TALKING DOLL

Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 9, 1979, Ser. No. 10,936
Int. Cl.³ A63H *5/00, 11/00, 2/28*
U.S. Cl. 46—118 **2 Claims**

1. An animated talking doll, comprising:
- a doll body having a head and a movable mouth defined thereon;
- sounding means within the doll body including means responsive to the passage of air for generating an audible sound;
- a manually operable air pump within said body communicating with said sounding means;
- manually operable means within said body for manipulating said mouth including a pivotal member and a reducing gear train, said pivotal member operatively connected to said reducing gear train, said gear train including means for converting a single pivotal movement of said member into at least two opening and two closing movements of said mouth; and



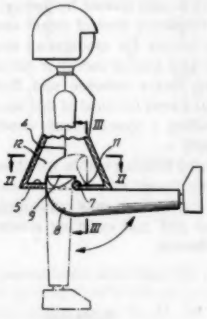
- a scissors mechanism operatively connected to open and close said mouth, said scissors mechanism connected to said gear train and including an extension arranged to control the air flow through said sounding means.

4,294,034

ARTICULATED FIGURE TOY

Jorge Magria-Deulofeu, and Jose Magria-Deulofeu, both of 157, Carretera del Medio, Hospitalet Barcelona, Spain

Filed Oct. 11, 1979, Ser. No. 83,962
Claims priority, application Spain, Nov. 21, 1978, 239583
Int. Cl.³ A63H *3/46, 3/20;* E05D *1/04*
U.S. Cl. 46—161 **5 Claims**



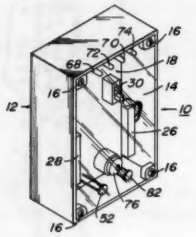
1. A figure toy comprising:
- a body portion having a chamber therein adjacent a wall of said body;
- at least one opening through said wall into said chamber, one edge of said opening defining a cylindrical bead a portion of which extends into said chamber;
- a simulated limb having an end portion extending through said opening and having a cylindrical recess in one side thereof pivotally embracing said bead; and
- the cross sectional size and shape of said end portion of said limb in the region of said recess being substantially the same as the size and shape of said opening, stop means on said limb, in said chamber and on the same side of said limb as said recess arranged to abut the inner surface of said wall and thereby limit pivotal movement of said limb about said bead in one direction in a position substantially perpendicular to said wall.

4,294,035

DEVICE WITH VISUAL AND AUDIO OUTPUT

David I. Klein, Columbia, Md., assignor to George Eng, Rockville, Md., a part interest

Filed Mar. 21, 1980, Ser. No. 131,945
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—227 **13 Claims**



1. An amusement device comprising:

(a) integrated circuit means having first and second oscillator circuits contained therein for producing output signals at predetermined first and second frequencies respectively;

(b) power means coupled to said integrated circuit means for activating said first and second oscillator circuits;

(c) visual output means coupled to an output terminal of said first oscillator circuit for producing visual output responsive to said first frequency;

(d) first frequency control means coupled to said first oscillator circuit for modulating said first frequency output of said first oscillator circuit;

(e) audio output means coupled to an output terminal of said second oscillator circuit for producing an audio output responsive to said second frequency;

(f) second frequency control means coupled to said second oscillator circuit for modulating said second frequency output of said second oscillator circuit;

(g) coupling means between said first frequency control means and a reset terminal of said second oscillator circuit for providing a synchronous visual output and audio output; and,

(h) an enclosed housing within which said integrated circuit means, said power means, said visual output means, said first and second frequency control means, said audio output means and said coupling means are contained and secured thereto.

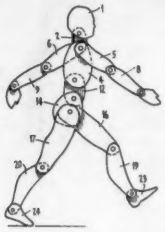
4,294,036

FIGURE FOR ARRANGEMENT ON MAGNETICALLY ATTRACTIVE SURFACE

David W. Wion, Glen Waverley, Australia, assignor to Magmate Australia Proprietary Limited, Glen Waverleg, Australia

Filed Aug. 20, 1979, Ser. No. 68,001
Claims priority, application Australia, Aug. 24, 1978, PD5647
Int. Cl.³ A63H *33/26*
U.S. Cl. 46—242 **7 Claims**

1. An articulated figure comprising a body component and a plurality of limb components pivotally attached to the body component, characterised in that at least said limb components are formed from flexible magnetic material, the flexibility of said magnetic material being such that the maximum possible surface to surface contact can be achieved between at least said limb components and a flat magnetically attractive surface by virtue of the magnetic attraction between said limb components and said magnetically attractive surface, said limb components therefore being held in any articulated position by said magnetic attraction, said limb components being attached to freely pivot relative to said body component by means of rivets



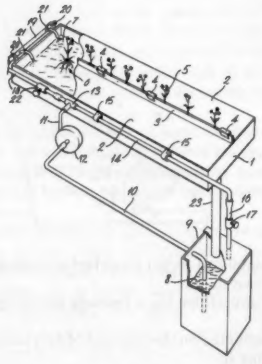
passing with clearance through holes in said body component and said limb components.

4,294,037

PRODUCTION OF MYCORRHIZAL FUNGI

Barbara Mosse, Harpenden, England, and John P. Thompson, Toowoomba, Australia, assignors to National Research Development Corporation, England

Filed Feb. 13, 1980, Ser. No. 121,171
Int. Cl.³ A01G *31/00*
U.S. Cl. 47—59 **23 Claims**



1. A process for the production of vesicular-arbuscular (VA) mycorrhizal fungi by growing a VA mycorrhizal fungus on plant roots wherein the invention comprises effecting said growth in nutrient film culture.

4,294,038

SOLAR PANEL WINDOW UNIT

James D. Davidson, 67 Grantour Ct., Pontiac, Mich. 48055

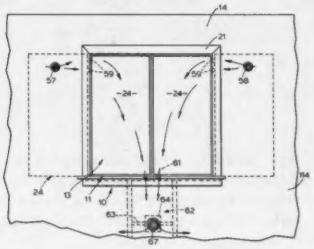
Continuation of Ser. No. 828,437, Aug. 29, 1977, abandoned. This application May 16, 1979, Ser. No. 39,448
Int. Cl.³ E05C *7/02*
U.S. Cl. 49—63 **8 Claims**

1. For use in combination with a window unit in a wall of a building including a window frame and glass panel means mounted in said window frame, a shutter unit, comprising:

first and second parallel extending track means having a spacing therebetween at least equal to the height dimension of said window unit, said track means being located on the inside of said buidling relative to said window unit and extending parallel to the plane of said glass panel means;

laminate insulative shield means mounted in said track means for movement between positions at the side of said win-

dow unit and in front thereof, to block off the entirety of said glass panel means to the inside of said building, said laminate insulative shield means including a frame movably supported on said track means and having an outside facing imperforate heat absorptive surface layer facing said glass panel and an insulation material layer mounted on the inside facing portion of said heat absorptive surface layer remote from said glass panel in said frame, said insulative material having little resistance against breakage when forces are applied in directions perpendicular to the plane thereof, said imperforate surface providing a protective barrier from the outside and a rigidification of



said insulative material against the effects caused by forces applied from the outside in directions perpendicular to the plane thereof;

seal means for effecting a seal around the periphery of said glass panel means and between said window unit and said insulative shield means to define a sealed chamber therebetween when said insulative shield means is in the blocking position; and

openable and closeable passageway means into and out of said sealed chamber defined between said glass panel means and said laminate insulative shield means when in the blocking position to facilitate the flow of fluid through said chamber.

4,294,039

PIVOTAL CONNECTION FOR HOODS AND COVERS IN MOTOR VEHICLES

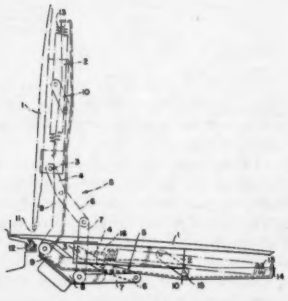
Walter Dalheimer, and Olaf Kuus, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 6, 1979, Ser. No. 72,912

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841092

Int. Cl.³ E05D *15/40*

U.S. Cl. 49—248 **8 Claims**



1. A pivotal connection for hoods or covers of motor vehicles which includes a lever means arranged between a bracket formed on the vehicle and the hood or cover, and a control means for controlling a positioning of an edge of the hood or cover which is nearest the pivot axis of the pivotal connection, characterized in that a track means is provided for supporting the hood or cover, the lever means includes a support arm having a first end rotatably mounted on the bracket and a second end connected with the track means, a two-armed guide lever means is pivotally mounted on the support arm and has a first arm a free end thereof which is pivotally connected to the track means, and a link means having a first end pivotally connected to the support arm and a second end pivotally connected to the track means at a position spaced from the pivotal connection of the first arm with the track means, the first arm, the track means, the link means, and a section of the support arm located between the first arm and the link means forming a four-bar linkage, and in that the control means includes a lever having a first end pivotally mounted at a free end of a second arm of the guide lever means and a second end pivotally connected to the bracket whereby, upon an opening of the hood or cover, the four-bar linkage undergoes a reversal such that an edge of the hood or cover nearest the pivot axis of the pivotal connection is first raised upwardly.

4,294,040

SAFETY DOOR FOR BUILDINGS AND ROOMS

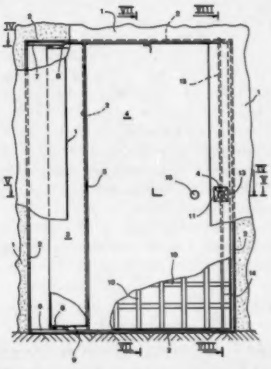
Bianca M. Crotti, Via Archirola, 125, Modena, Italy

Filed Oct. 1, 1979, Ser. No. 80,921

Claims priority, application Italy, Sep. 29, 1978, 40125 A/78

Int. Cl.³ E05D *15/58*

U.S. Cl. 49—254 **13 Claims**



1. A safety door assembly for buildings and rooms in general, the assembly comprising fixed works (1); a door including two main transversely sliding parts (3, 4), one of said parts being a supporting column (3) of given width and the other of said parts being a door body (4) which is much wider than said given width of said column; hinge means (5) between a first edge of said column and a first edge of said door body for supporting said door body for movement about an axis defined by said hinge means; a first recess (17) in said fixed works along a side thereof into which said supporting column substantially disappears during opening, said hinge means remaining outside said first recess during opening; a second recess (37) in said fixed works opposite said first recess; lock means including operating means installed in said door body in vicinity of an edge thereof opposite said hinge means, said lock means substantially disappearing into said second recess during closing; respective openings (11, 12) on opposite side of said fixed works opening into said second recess for allowing access to said operating means of said lock means from inside and outside when said door body is in said second recess while preventing access to said lock means; respective grooves (9) along

upper and lower edges of said supporting column (3); respective fixed guide (6, 7) adjacent said grooves (9); and rolling, or sliding means (8) received in said grooves and movable therein.

4,294,041

MOBILE MACHINES FOR REMOVING SURFACE IRREGULARITIES FROM RAIL HEADS

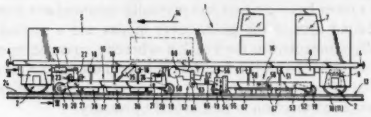
Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Division of Ser. No. 968,264, Dec. 11, 1978. This application Jun. 2, 1980, Ser. No. 155,559

Claims priority, application Austria, Dec. 30, 1977, 9451/77

Int. Cl.³ E01B *31/12*

U.S. Cl. 51—5 C **4 Claims**



1. A mobile machine mounted on a track for advancement therealong, the track having two rails including heads, for removing irregularities from the surfaces of the rail heads to a predetermined depth, which comprises

(a) a machine frame,

(b) a tool carrier rigidly resistant to bending and vertically adjustably mounted on the machine frame and arranged thereon for vertical and lateral guidance without play along a respective one of the track rails,

(c) a cutter head on the tool carrier, the cutter head having

(1) a cutting tool capable of machining the surface of the head of the respective track rail continuously upon advance of the tool carrier along the track rail,

(d) a hydraulic jack unit linking the tool carrier to the machine frame for vertically adjusting the tool carrier and subjecting the tool carrier to a vertically directed loading force sufficient to obtain the predetermined machining depth,

(e) an additional tool carrier and a rail grinding tool on the additional tool carrier, and

(f) drive means for imparting to the additional tool carrier a working movement in the direction of the track additional to that simultaneously imparted to it by the advancement of the machine.

4,294,042

APPARATUS AND METHOD FOR GRINDING A HELICAL SURFACE ON A FLAT BLADE

Robert W. Davenport, Golden; Eugene L. Moore, Lakewood, and Ronald L. Goodman, Woodland Park, all of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Sep. 5, 1979, Ser. No. 72,740

Int. Cl.³ B24B *3/40, 3/42*

U.S. Cl. 51—54 **22 Claims**

1. Apparatus for grinding a helical cutting surface on a flat cutting blade, comprising:

a stationary support,

an arbor for mounting said blade, said arbor being rotatably mounted on said support about an axis of rotation, said arbor having at least two mutually perpendicular planar surfaces which are disposed oblique to said axis of rotation;

means for mounting said blade on one of said planar surfaces,

an adjustable cam plate mounted on the other of said planar surfaces,

means for adjusting all points along the lower surface of said cam plate such that said lower surface is equidistant from said axis of rotation,

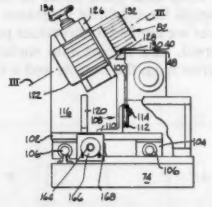
a carriage mounted on said support for reciprocation along a plane parallel to said axis of rotation,

a cam follower for contacting said lower surface,

means for mounting said cam follower on said carriage,

means for grinding said blade, and

means for mounting said grinding means on said carriage such that said grinding means may be reciprocated along a plane parallel to said axis of rotation,



whereby when said carriage and said grinding means are reciprocated, said cam follower contacts the lower surface of said cam plate, said arbor is oscillated about its axis of rotation and a helical cutting surface is ground into said blade.

4,294,043

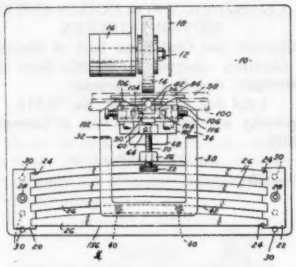
ICE SKATE SHARPENER

Glenn Sakcriska, 1714 Abbott, Ann Arbor, Mich. 48103

Division of Ser. No. 869,696, Jan. 16, 1978, Pat. No. 4,172,343, which is a continuation-in-part of Ser. No. 745,362, Nov. 26, 1976, Pat. No. 4,069,620. This application Aug. 27, 1979, Ser. No. 70,408

Int. Cl.³ B24B *9/04*

U.S. Cl. 51—100 R **11 Claims**



1. In a scale for use in conjunction with ice skate blade sharpening and contouring, there being an equivalent center location on the ice skate blade to be sharpened and contoured, the improvement characterized by,

a generally oblong scale for determining the equivalent center location on the ice skate blade comprising,

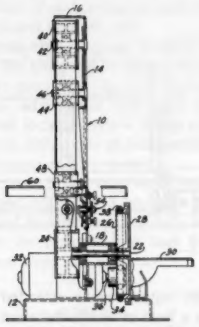
a zero mark on the scale to be placed adjacent the front of the blade, a first set of separately identifiable marks on the scale for identifying the length of a particular blade, a second set of separately identifiable marks on the scale indicating said equivalent center locations, each mark of the second set paired to a mark in the first set and located from the mark in the first set a specified percentage of the distance between the mark in the first set and the zero mark.

4,294,044

TRACKING MECHANISM FOR A BELT TYPE SANDER

John M. Hansen, Dover Township, Racine County, Wis., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 2, 1980, Ser. No. 155,284
Int. Cl.³ B24B *21/18*
U.S. Cl. 51—135 BT **5 Claims**



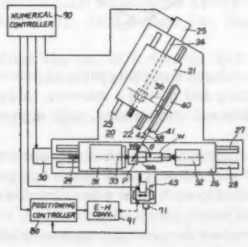
1. In a belt sanding machine having a frame, drive and idler pulleys mounted for rotation in spaced relationship on said frame and an endless sanding belt extending over said pulleys, an arm having one end pivotally mounted on said frame and carrying an idler drum mounted for rotation on the other end thereof, said arm being tiltable about a longitudinal center line extending through its axis of rotation and the axis of rotation of said idler drum and having a normal position in which the axis of rotation of said idler drum is parallel with the axis of said pulleys, said idler drum being arranged to engage and tension said sanding belt at points between said pulleys when said arm is swung to either of two angularly spaced positions, belt tracking means for adjustably tilting the axis of rotation of said idler drum from its normal position comprising spring means acting to tilt said arm in one direction from its normal position and separate screw threaded means on said frame positioned so as to engage said arm and to adjustably oppose the tilting of said arm in said one direction when said arm is in either of its said two positions.

4,294,045

GRINDING MACHINE WITH A SIZING DEVICE

Minoru Enomoto, Ohbu; Takao Yoneda, Toyoake, and Yoshiyuki Takeuchi, Gamagouri, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 23, 1980, Ser. No. 114,646
Claims priority, application Japan, Jan. 30, 1979, 54-9502
Int. Cl.³ B24B *49/02*
U.S. Cl. 51—165.71 **6 Claims**



1. A grinding machine for simultaneously grinding with a grinding wheel a cylindrical surface and a shoulder side surface perpendicular thereto of a workpiece, comprising:

a bed;

work support means slidable on said bed, for carrying said workpiece for rotation about an axis extending in the sliding direction of said work support means;

a wheel support carrying said grinding wheel and slidable on said bed for movement along a straight path extending at an acute angle to the rotational axis of said workpiece;

first and second feed means connected to said work support means and said wheel support for moving the same on said bed, respectively;

a sizing device having feeler means engageable with said cylindrical surface of said workpiece for measuring the diameter of said cylindrical surface;

guide means for slidably guiding said sizing device in a direction parallel to the rotational axis of said workpiece;

third feed means connected to said sizing device for moving the same along said guide means; and

a positioning controller connected to said third feed means for controlling the same and including

first calculation circuit means responsive to first input data indicative of a desired finish diameter of said cylindrical surface for calculating a cotangent component at said acute angle of said desired finish diameter,

second calculation circuit means responsive to said first calculation circuit means and second input data indicative of a first distance spaced from said shoulder side surface for adding said cotangent component and said second input data to thereby obtain command data indicative of a second distance from an intersection at which the rotational axis of said workpiece intersects a line extending through the juncture between first and second surfaces of said grinding wheel in parallel relation with said straight path, said first and second surfaces of said grinding wheel corresponding, respectively, to said cylindrical and shoulder side surfaces of said workpiece, and

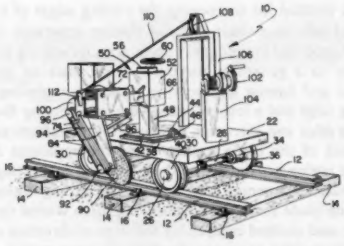
control means responsive to said second calculation circuit means for controlling said third feed means to position said feeler means at a position which is spaced said second distance from said intersection.

4,294,046

TRAVELING TOOL CARRIER FOR SEVERING RAILWAY SPIKES

Luigi Damiano, 135 Farm St., Providence, R.I. 02908

Filed Mar. 26, 1980, Ser. No. 133,976
Int. Cl.³ B24B *23/00*
U.S. Cl. 51—170 R **10 Claims**



1. A traveling tool carrier for severing heads of railway spikes prior to removal or replacement of railway rails, comprising a platform having front and rear wheels mounted on the underside thereof for rolling engagment with said rails, a support mounted on said platform, a vertical adjustment assembly mounted on said support, a horizontal adjustment assembly secured to said vertical adjustment assembly for vertical movement therewith, a saw support assembly mounted on said horizontal adjustment assembly for movement therewith, a rotating saw suspended from said saw support assembly and disposed such that the plane thereof is inclined to the vertical,

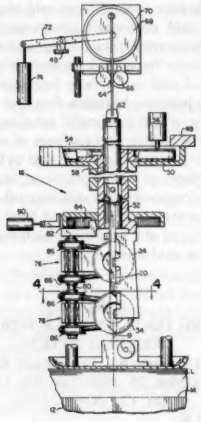
wherein said saw is angularly engageable with said spike heads upon traveling movement of said platform, means mounted on said vertical and horizontal assemblies for vertically and horizontally adjusting said saw support assembly and the saw suspended therefrom in the angular operative position thereof, and means mounted on said platform for rotating said saw for severing the heads of said spikes as said platform is moved over said rails.

4,294,047

METHOD OF SHARPENING LATERAL EDGES AND END EDGES OF A BLADE DURING RECIPROCATION THEREOF

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Jan. 14, 1980, Ser. No. 111,527
Int. Cl.³ B24B *1/00, 3/36*
U.S. Cl. 51—327 **7 Claims**



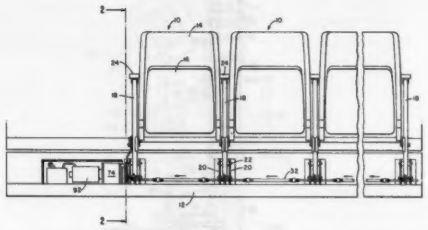
1. A method for sharpening the cutting edges of a reciprocating blade on a sheet material cutting apparatus, the blade being supported for generally vertical reciprocating movement relative to a generally horizontal sheet material supporting surface and having a generally vertically extending leading cutting edge and a lower cutting edge intersecting the leading cutting edge and extending downwardly therefrom and in the direction of the blade trailing edge, the apparatus having a cutting region proximate the sheet material supporting surface and a blade sharpening region above the cutting region, and at least one blade sharpening wheel supported within the cutting region, said method comprising the steps of elevating the blade from the cutting region to the blade sharpen region, reciprocating the blade within the sharpening region, biasing the one sharpening wheel toward the blade and into sharpening engagement with the leading cutting edge of the blade and maintaining the one sharpening wheel in sharpening engagement with the leading cutting edge as the blade moves upwardly from a lower limit toward an upper limit within the sharpening region, and moving the one sharpening wheel under the leading edge of the blade and in sharpening engagement with the lower cutting edge of the blade as the blade approaches and moves to the upper limit of its travel within the sharpening region.

4,294,048

APPARATUS FOR SUPPORTING PIVOTALLY MOUNTED SEATS

David L. Sutter, Kennebunkport, Me., assignor to Hussey Manufacturing Co., Inc., North Berwick, Me.

Filed Feb. 4, 1980, Ser. No. 118,393
Int. Cl.³ E04H *3/12;* A47C *1/12*
U.S. Cl. 52—9 **12 Claims**



1. Apparatus for supporting an extended row of adjoining seats to pivot on a base in unison between an upright and a collapsed position comprising:

(a) means for applying pivotal force to each seat which is substantially equal and opposite to the pivotal force on the seat of the weight of the seat in any position between and including the upright and collapsed positions, and

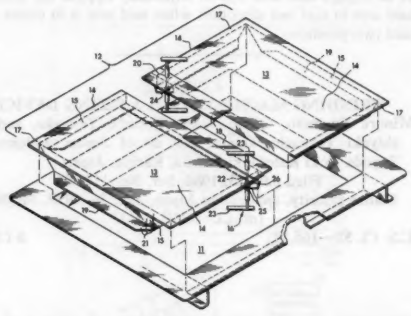
(b) releasable means for locking the row of seats respectively in the upright and collapsed positions.

4,294,049

QUICK OPENING INTERNAL MANWAY FOR TOWERS

Dick K. Young, and Kenneth E. Sumner, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation of Ser. No. 6,604, Jan. 16, 1979, abandoned. This application Jan. 31, 1980, Ser. No. 117,159
Int. Cl.³ E02D *29/14*
U.S. Cl. 52—20 **2 Claims**



1. An improved quick opening internal manway cover for selectively opening and closing a manway, said manway having an edge disposed therearound, said improved manway cover comprising:

opposing identical panels for selectively opening and closing one-half of said manway, said panels being opposing and non-connected to each other when closed in said manway, each of said panels comprising:

(a) a cover piece for covering approximately one-half of said manway, said cover having means extending therefrom for overlying a portion of the top of said manway edge,

(b) means extending downward from said cover piece for

positioning said panel in said manway against said manway edge,

(c) means connected to said positioning means on said cover piece opposite the side where said panel abuts the opposing panel for extending under said manway edge,

(d) means connected to the top surface of said cover piece for overlying a portion of the top surface of the top of the cover piece of said opposing panel when said panels are in said closed position, and

(e) means operatively connected through said cover piece near where the aforesaid overlying means is connected to said cover piece for releasably locking said panel to said manway edge when said panel is in said closed position, said locking means being capable of being operated from either side of said panel,

and

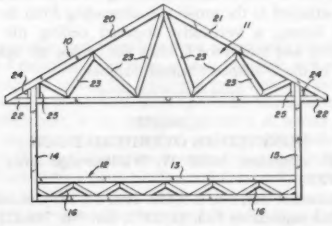
said improved cover being capable of being opened and closed on either side of said cover in said manway by operation of said locking means to fully release either one of said panels for removal and then by removing the remaining panel from said manway.

4,294,050

TRUSS-FRAMED BUILDING STRUCTURES

Arnold Kandel, P.O. Box 416, Fairfax, Va. 22030

Filed Jan. 24, 1980, Ser. No. 114,747
Int. Cl.³ E04B *7/02*
U.S. Cl. 52—93 **4 Claims**



1. A roof truss made of unitized wooden frame elements comprising a pair of centrally interconnected upper chords which provide the upper sloped surfaces of a roof, said upper chords being joined near their outer ends by a horizontal lower chord which is discontinuous near each end thereof, and vertical risers interconnecting said lower chord on both sides of each discontinuity with said upper chord to form post-receiving pockets near each end of said lower chord, said post-receiving pockets being backed up by a prenailed gusset on one side of said truss.

4,294,051

MODULAR BUILDING SYSTEM

William J. Hughes, Jr., 2100 College Dr., Baton Rouge, La. 70808

Filed May 21, 1979, Ser. No. 40,878
Int. Cl.³ E04C *1/08, 1/28*
U.S. Cl. 52—98 **5 Claims**

1. A building having an exterior wall structure which comprises:

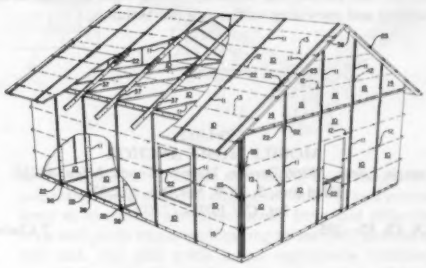
(a) a series of like panels and sub-divisions thereof, each of which has a plurality of defined internal horizontal passages with said passages of adjacent panels being in alignment; said panels capable of being subdivided along any line normal to said passages to provide a subdivided panel having an edge configuration identical to the edge of the uncut panel;

(b) fins positioned between adjacent panels, said fins being constructed of material having greater shear strength than said panels and having openings therein in alignment with said passages;

(c) load transferring members positioned in a plurality of said openings in said fins, each of said members extending partially into said aligned passages of said panels on each side of a fin; and

(d) integrating means positioned in and extending through a plurality of said aligned passages and openings of said panels and fins respectively, each of said integrating means extending continuously through a plurality of said panels and fins and being anchored at each end thereof and maintained in state of tension so as to maintain said panels and fins under compression in the horizontal direction;

said building also having a ceiling and roof each of which



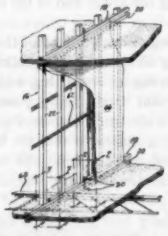
comprises at least one row of panels with fins positioned between adjacent panels, said panels and fins being alike and interchangeable with said panels and fins of said wall structure and being held in assembled relation by a plurality of integrating means passing through aligned passages and openings in said panels and fins respectively, each of said integrating means being maintained in a state of tension and secured at opposite ends of said ceiling and roof respectively so as to maintain said panels and fins under compression, load transferring members positioned in a plurality of the openings in said fins and extending partially into said passages of the adjacent panels each of said fins having a width in excess of the thickness of said panels such that a portion of each of said fins extends beyond the surface of the panels, and auxiliary strengthening members secured to said portions of a plurality of said fins so as to augment the strength of the fins.

4,294,052

PREFABRICATED LOAD BEARING STRUCTURE

Aaron Blauer, 386 Strathcona Dr., Town of Mount Royal, Quebec, Canada

Filed Nov. 19, 1979, Ser. No. 95,400
Int. Cl.³ E04H *1/00*
U.S. Cl. 52—236.5 **11 Claims**



1. A multi-storey building having a foundation and a roof, the building comprising a plurality of poured concrete floors,

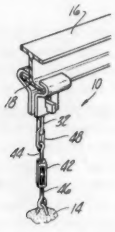
the poured concrete floors being separated by parallel walls, each wall comprising a row of a plurality of prefabricated panels made up of structural tubular members, the panels extending from one floor to a next adjacent floor, each panel having parallel upper and lower chords, each wall being in vertical alignment with corresponding wall situated on vertically adjacent floors, each vertically adjacent wall being interconnected by high-tensile strength fasteners rigidly interconnecting the upper chord of each panel to an adjacent lower chord of a vertically adjacent panel, each fastener having a length at least greater than the combined thickness of the upper and lower chords of vertically adjacent panels and the floor therebetween, the rows of vertically interconnected prefabricated panels providing effective continuous lightweight bearing walls extending from the foundation of the building to the roof thereof, the bearing walls supporting loads imposed on the building and providing stiffness to the building.

4,294,053

MOBILE HOME ANCHOR

Rosario Lopes, 19266 Berden, Harper Woods, Mich. 48225

Filed Jun. 5, 1978, Ser. No. 912,321
Int. Cl.[3] E02D *27/00*
U.S. Cl. 52—295 **7 Claims**



1. In combination with a mobile home having an underframe with an I-beam and said mobile home being mounted above a base, an anchor for detachably securing said I-beam to said base comprising:

a pair of spaced clamping elements, each clamping element having an upper flange engaging portion and a downwardly depending portion, each downwardly depending portion having an aperture formed therethrough;

elongated connecting means extending from between the downwardly depending portions of the clamping elements and to said base, said connecting means having an aperture at its upper end;

means for securing the lower end of the connecting means to the base;

means for attaching the upper end of the connecting means to the clamping elements, said attaching means comprising a clevis having a central leg and two end legs, the central leg of said clevis being positioned through the apertures in said clamping elements and in the upper end of the connecting means so that the clevis and legs face downwardly and extend along the outside faces of the clamping element downwardly depending portions below said apertures; and

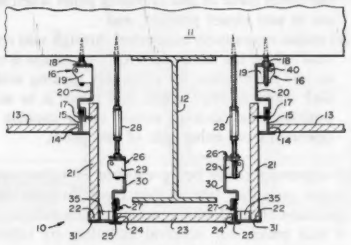
means for tensioning said elongated connecting means to thereby hold said clevis to said clamping elements and so that said clevis prevents separation of said downwardly depending portions and thus separation of said clamping elements.

4,294,054

SOFFIT SYSTEM FOR SUSPENDED CEILING

Albert F. Kuhr, Elk Grove Village, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Aug. 9, 1979, Ser. No. 65,398
Int. Cl.[3] E04B *5/52*
U.S. Cl. 52—484 **1 Claim**



1. A suspended ceiling boxed around a projection depending from ceiling joists, said suspended ceiling comprising in combination:

a plurality of suspension brackets depending from the ceiling and terminating at the bottom thereof in inverted-T runners;

a plurality of ceiling tiles resting on the inverted-T runners;

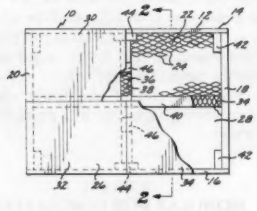
at least one U-shaped channel resting on an inverted-T runner adjacent to the projection depending from the ceiling and having a vertically disposed ceiling tile resting therein, and means for holding the ceiling tile against the side of the U-shaped channel member.

4,294,055

HONEYCOMB OVERHEAD DOOR

Donald D. Andresen, 10380 W. Whitesbridge Ave., Fresno, Calif. 93706

Continuation of Ser. No. 479,643, Jun. 17, 1974, abandoned.
This application Feb. 14, 1977, Ser. No. 768,325
Int. Cl.[3] E05C *2/32*
U.S. Cl. 52—795 **5 Claims**



1. A panel construction useful for doors which are supported at side bearing points and are supported thereby in an overhead, horizontal position which comprises:

a plurality of cores formed of a honeycomb structure defined by a plurality of parallel strips of sheet material, each formed into a sinuous path and bonded to immediately adjacent strips at its outwardly bowed extremities, said core being aligned with said strips extending across the width of said door;

said cores being interspaced by internal spline members, each spline member being formed of a core of said honeycomb structure;

upper and lower cross frame members;

covering sheets extending over the opposite sides of said honeycomb core; and,

foamed adhesive material on the interior surfaces of said covering sheets and drawn up on said strips of sheet material, forming a continuous fillet at the juncture of the edges of said strips and said covering sheets, thereby bonding said sheets to the edges of said strips of said core of honeycomb structure.

4,294,056

VACUUM PACKAGING MACHINE

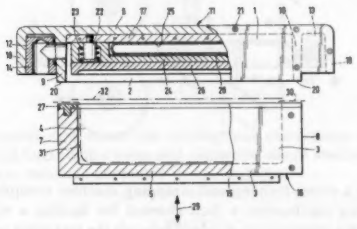
Ralf Paulsen, Kapellenweg 1, Buchenberg; Max Sontheim, An der Steig 17, Wiggensbach, and Christoph Ullmann, Falkenweg 17, Kempten, all of Fed. Rep. of Germany

Filed Oct. 1, 1979, Ser. No. 80,924

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843166; Aug. 8, 1979, 2932098

Int. Cl.³ B65B *31/02, 43/08, 47/10*

U.S. Cl. 53—86 **6 Claims**



1. A vacuum packaging machine comprising chambers for forming a packaging foil from at least two foils and means for evacuating and sealing the packages, each chamber comprising an upper and a lower part, which parts are movable relative to one another and, in an operative position in which they are pressed together, clamp marginal portions of the foils therebetween, each chamber part having a hollow recess in its central region formed by a plate portion and four walls arranged in a rectangle, said walls depending from said plate portion of said upper part and upstanding from said plate portion of said lower part to form a single chamber when pressed together, wherein at least one of said chamber parts is made from a preformed length of material having an appropriate cross-sectional profile to provide two opposite walls integral with said plate, and the other two walls are formed by covers attached to said integral walls and plate.

4,294,057

CASE PACKER APPARATUS INCLUDING VELOCITY COMPENSATOR ASSEMBLY

Michael E. Winiasz, and James M. Long, both of Lorain, Ohio, assignors to A-T-O, Inc., Willoughby, Ohio

Continuation-in-part of Ser. No. 895,815, Apr. 12, 1978, Pat. No. 4,199,291. This application Apr. 21, 1980, Ser. No. 141,774

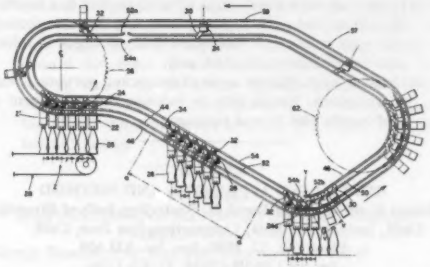
Int. Cl.³ B65B *21/12*

U.S. Cl. 53—244 **7 Claims**

1. In a case packer apparatus including a frame, a driven conveyor for moving empty cases through a fixed course having a horizontal section, said cases being moved at a fixed speed in said horizontal section, and a driven conveyor means having a fixed, closed orbit positioned in a vertical plane above said conveyor horizontal section, said conveyor means being driven at a greater speed than said fixed speed, a drive sprocket and a guide sprocket for said driven conveyor means, article gripper means, and carrier bars for said article gripper means operatively connected to and movable with said conveyor means, a driven article supply conveyor positioned below said driven sprocket, a pair of control arms for each said carrier bar individually fixedly secured to different ends of said carrier bar, to form carrier bar units,

said driven conveyor means having a course extending downwardly towards said horizontal section at an acute angle thereto and then upwardly from an inflection area or zone at an acute angle thereto, said inflection area being the area of transfer of an article in relation to said driven conveyor and said conveyor means, and characterized by

pairs of longitudinally spaced first guide means and second guide means on said frame to engage one of said control arms and control the angular relationship of said carrier bars and gripper fingers to the axis of said conveyor means



as the carrier bar units are descending towards and into said inflection area and to engage the other of said control arms as its carrier bar moves away from said inflection area, said guide means each having an entrance end and an exit end, and said guide means operatively extending around the orbit of said driven conveyor means and being varied in spaced from such orbit to vary the positions of said gripper means in relation to a vertical axis.

4,294,058

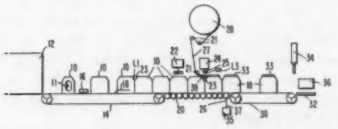
CONTAINER PACKAGE AND ITS MANUFACTURE

Jürgen G. Rensner, Philadelphia, Pa., assignor to Pepsico, Inc., Purchase, N.Y.

Continuation of Ser. No. 812,327, Jul. 1, 1977, abandoned, which is a division of Ser. No. 697,578, Jun. 18, 1976, Pat. No. 4,078,659. This application Apr. 3, 1979, Ser. No. 26,772

Int. Cl.³ B65B *61/14*

U.S. Cl. 53—413 **26 Claims**



1. A method of attaching thermoplastic film handles to adjacent packages of articles tightly wrapped in thermoplastic film, said packages having an upper surface, said method comprising the steps of:

(a) providing a weakened portion in the upper surfaces of said thermoplastic film for opening said packages:

(b) contacting thermoplastic handle film tacked to said thermoplastic wrapping at a first side at a location below the level of said weakened portion of a first said package, with a second location on said thermoplastic wrapping on an opposite side of said first package;

(c) heating said handle film in contact with said opposite side of said first package to tack said handle film to said first package thermoplastic wrapping at the location of said contact, while leaving an area of the handle film adjacent the tack at least partially untacked;

(d) contacting another portion of said thermoplastic handle film with a first location on said thermoplastic wrapping on a first side at a location below the level of said weakened portion of a second said package;

(e) heating said handle film in contact with the thermoplastic wrapping on said first side of said second package to tack said handle film to said second package thermoplastic wrapping at the location of said contact, while leaving an area of the handle film adjacent the tack at least partially untacked;

(f) severing said handle film between said tacks on said opposite side of said first package and said first side of said second package;

(g) repeating steps (b) through (f) with respect to a location on said second package opposite to said first side thereof, and with respect to subsequent said packages to which said handle film is attached; and

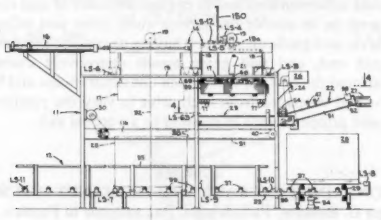
(h) heating said adjacent areas of the tacked portions of said thermoplastic handle film to increase the attachment of said handle film to said packages.

4,294,059

BIN FILLING APPARATUS AND METHOD

Robert E. Stilwell, and David E. Westerling, both of Riverside, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Feb. 22, 1980, Ser. No. 123,606
Int. Cl.³ B65B *35/38, 35/52, 1/16*
U.S. Cl. 53—448 **26 Claims**



19. Apparatus for receiving generally rounded articles from an article supply source and for spreading the articles laterally in a close-packed array over a predetermined width wherein the outlet from the supply source is substantially narrower than the predetermined width, said apparatus comprising an inclined spreading conveyor with means mounting an elevated end adjacent to the narrow supply source outlet, means for intermittently driving said spreading conveyor to advance toward said elevated end whereby articles collecting thereon while said spreading conveyor is stationary tend to spread transversely at the lower end thereof while said spreading conveyor is being driven.

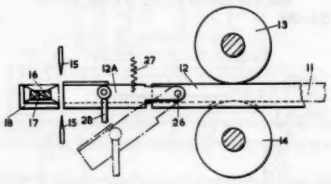
22. A method of filling loose articles of produce of generally rounded configuration and of random sizes and shapes, such as apples, into a bin, said method comprising the steps of assembling a layer of said articles on a generally flat surface in a closely packed and randomly oriented array where said articles are in abutting engagement with each other throughout the layer, moving a vacuum head with a plurality of depending vacuum pickup cups over and onto said layer to cause the cups to grip substantially all of the articles in the layer within the confines of the vacuum head, there being substantially more vacuum cups on said vacuum head than articles to be gripped, moving the vacuum head over and into said bin, removing the vacuum from the cups to release the layer of articles in the bin directly adjacent to the previously loaded layer of articles or to the bottom of the bin, and repeating the aforesaid steps until the bin is filled to the desired level, wherein the step of assembling the layer of articles comprises randomly receiving the articles from a supply conveyor having a width substantially narrower than said layer, and causing the articles to gravitate over an intermediate conveyor between said supply conveyor and the assembling area, which intermediate conveyor is driven in a direction opposite to the direction of movement of the articles to cause the articles to uniformly spread to the width of the layer to be picked up in the assembling area.

4,294,060

SWEET FORMING AND WRAPPING MACHINE

Arthur V. Naylor, Seacroft, and John K. Spencer, Gainsborough, both of England, assignors to Baker Perkins Holdings Limited, Peterborough, England

Continuation-in-part of Ser. No. 877,290, Feb. 13, 1978, abandoned. This application Apr. 17, 1979, Ser. No. 30,837
Claims priority, application United Kingdom, Feb. 18, 1977, 6822/77
Int. Cl.³ B65B *57/02*
U.S. Cl. 53—506 **3 Claims**



1. In a sweet-forming and wrapping machine comprising a wrapping mechanism, a feed channel for feeding a rope of candy in a normal path of travel towards the wrapping mechanism, feed rollers for advancing the rope along said feed channel, cutting means for severing sweets in succession from the leading end of the rope, means for transferring the sweets in succession into the wrapping mechanism, means for feeding wrappers in succession into the path of travel of the sweets so that each sweet enters the wrapping mechanism with a wrapper partially folded about it drive means for driving said machine, a detector for sensing the feed of the wrappers and a machine stopping switch operable instantaneously by said detector to stop said machine drive in response to detection of a failure in the wrapper feed, the improvement which consists in the provision, in a machine capable of running at such a high speed that the wrapping mechanism overruns an amount sufficient to complete wrapping of partially wrapped sweets following the stopping of said machine drive by said stopping switch, of means responsive instantaneously to operation of said machine stopping switch by said detector to immediately divert said rope out of its normal path of travel and away from said cutting means, notwithstanding the overrun of said wrapping mechanism following the stopping of said machine drive.

4,294,061

COMESTIBLE PACKAGING APPARATUS

John P. Lekas, 5316 E. Exeter Blvd., Phoenix, Ariz. 85019

Filed Sep. 13, 1978, Ser. No. 942,126
Int. Cl.³ B65B *35/50*
U.S. Cl. 53—536 **5 Claims**

1. Apparatus for automatically packing trays of comestibles having

conveyance means for incrementally supplying a plurality of trays

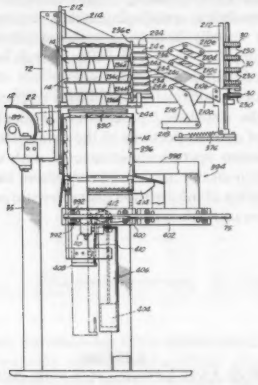
shelf means for receiving the trays, said shelf means including a plurality of individually extendable shelves, said shelves having retraction means,

feed comb means for transferring the trays from the conveyance means to said shelves of said shelf means

alignment means for incrementally moving said shelf means to sequentially align at least some of said plurality of shelves with said conveyance means to receive a tray

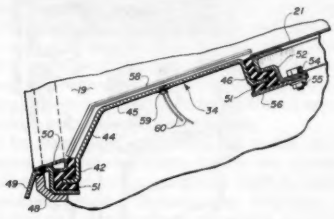
reset arm means for individually extending at least some of said plurality of shelves to receive a tray, said retraction means on said shelves causing at least some of said shelves

to retract as soon as said reset arm means stops causing each of said plurality of shelves to be individually extended, thereby causing the trays to stack, and



cycloidal cam means for causing said conveyance means, said feed comb means, said alignment means and said reset arm means to cooperate in synchronism.

4,294,062
SENSING BAR
Shaun A. Seymour, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.
Filed Mar. 27, 1980, Ser. No. 134,721
Int. Cl.[3] A01F *12/10*
U.S. Cl. 56—102 **12 Claims**



1. In an infeed housing for a harvesting and threshing machine attachable on a first end to a harvesting attachment and on a second end to the harvesting and threshing machine effective to receive from the harvesting attachment crop material collected from a field and convey it into the harvesting and threshing machine for processing having:

(a) a frame with a bottom surface, an upper surface and two opposing sides thereby defining a flow passage for crop material as it is conveyed to the machine;

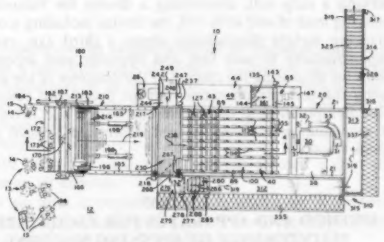
(b) conveying means moveably mounted to the infeed housing to convey crop material from the harvesting attachment to the machine and cooperative with the bottom surface to thereby define a predetermined path of travel within the flow path, said conveying means including a front guide drum mounted above said path of travel of said crop material adjacent said first end of said infeed housing for deflecting material entering said first end downwardly toward said bottom surface;

(c) object removal means moveably connected to the infeed housing intermediate the first end and the second end effective to remove non-frangible objects from the predetermined path of travel;

(d) non-frangible object detecting means connectable to the object removal means and mountable to the infeed housing; and

(e) sensing means for sensing non-frangible objects fastened to the bottom surface adjacent the first end between the two opposing sides positioned along the predetermined path of travel and connectable to the object detecting means, the sensing means having a first portion adapted to contact a non-frangible object within said crop material flow path and direct the non-frangible object upwardly toward said guide drum and a second portion adapted to contact non-frangible objects deflected downwardly by said guide drum and to guide the non-frangible object toward the object removal means, the contact with the sensing means by the object further being effective to permit the object detecting means to selectively actuate the object removal means to eject the object from the infeed housing.

4,294,063
HARVESTER AND METHOD FOR HARVESTING GREEN TOMATOES
George Bianchi, P.O. Box 190, Merced, Calif. 95341
Filed Feb. 7, 1980, Ser. No. 119,308
Int. Cl.[3] A01D *17/08*
U.S. Cl. 56—16.4 **10 Claims**



1. A harvester for green tomatoes growing on vines in a row comprising:

A. a frame;

B. means supporting the frame for travel along such a row;

C. means on the frame for severing vines in the row from the ground as the frame travels along the row;

D. an aqueous bath mounted on the frame;

E. means mounted on the frame above the bath adapted to receive vines with tomatoes thereon from the severing means and to shake tomatoes from the severed vines into the bath while excluding the vines from the bath and discarding the same;

F. means on the frame for removing tomatoes from the bath; and

G. means on the frame for drying surface moisture from the tomatoes removed from the bath, in which the bath comprises a tank having a dividing wall separating the tank into a tomato washing compartment and a water cleaning compartment interconnected in a closed circuit, a pump for circulating water in the closed circuit from the tomato washing compartment to the water cleaning compartment and return in a predetermined direction of flow in each compartment, a straining conveyor mounted in the tomato washing compartment and upwardly inclined from the tank at a position in the predetermined direction of flow therein to strain tomatoes from the bath and to elevate them from the tank and a sieving conveyor mounted in the water cleaning compartment and upwardly inclined from the tank at a position in the predetermined direction of flow therein to sieve debris from the bath and to elevate it from the tank.

4,294,064

METHOD OF AND A DEVICE FOR BALANCING A CHANGING LOAD OF A STRIP ROLL ORBITING ABOUT AN AXIS IN A STRIP WINDING MACHINE

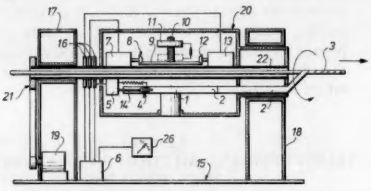
Günther Schmitz, Odenthal, and Hans Kierdorf, Cologne, both of Fed. Rep. of Germany, assignors to Felten & Guilleaume Carlswerk, Cologne, Fed. Rep. of Germany

Filed Jan. 25, 1980, Ser. No. 115,288

Claims priority, application Fed. Rep. of Germany, Jan. 1, 1979, 2903807

Int. Cl.[3] B65H *81/06*

U.S. Cl. 57—3 14 Claims



6. A strip winding machine, including a stationary frame, a winding head rotating about a first axis, at least one head disk supported in said winding head for rotation about a second axis which is perpendicular to said first axis and being adapted for carrying a strip roll, comprising a device for balancing the changing load of said strip roll, the device including a counterbalancing weight displaceable about a third axis extending perpendicularly to said first axis opposite said second axis; means for measuring the change of the diameter of the strip roll during the winding operation and for producing control signals corresponding to the measured change; and drive means for said counterbalancing weight controlled by said control signals.

4,294,065

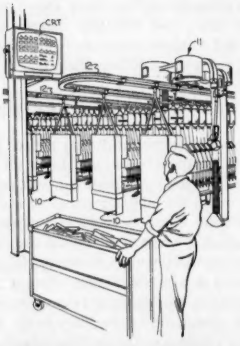
METHOD AND APPARATUS FOR FACILITATING MAINTENANCE OF SPINNING MACHINE INFORMATION SYSTEM

John E. Lane, Littleton, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.

Continuation-in-part of Ser. No. 900,267, Apr. 26, 1978, Pat. No. 4,194,349. This application Sep. 24, 1979, Ser. No. 77,929

Int. Cl.[3] D01H *13/32;* G06F *11/32;* H04Q *9/00*

U.S. Cl. 57—265 10 Claims



1. In apparatus for displaying information regarding the operating conditions of a group of ring spinning machines in a textile mill wherein each machine has instrumentalities from which strand material issues and by which strand material is formed into packages during winding thereof, and detectors on each machine for signalling occurrences of events characteristic of certain operating conditions of the machines, and wherein the apparatus has a data system with distributed processors responsive to the detectors on each machine for determining said certain operating conditions of each machine of the group of machines, and display means responsive to the processors for visually displaying such certain operating conditions, the improvement in the data system which facilitates maintenance thereof and comprises:

malfunction detection circuit means operatively connected with the distributed processors for identifying malfunctions of defined portions of the data system, and

output means operatively connected with said malfunction detection circuit means and responsive thereto for effecting display of information characteristic of the nature and location of malfunctions.

4,294,066

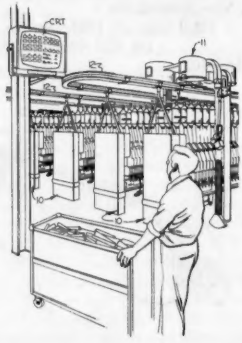
METHOD AND APPARATUS FOR DISPLAYING SPECIFIC SPINNING MACHINE OPERATING CONDITIONS

John E. Lane, Littleton, Mass., assignor to Parks-Cramer Company, Fitchburg, Mass.

Continuation-in-part of Ser. No. 900,267, Apr. 26, 1978, Pat. No. 4,194,349. This application Sep. 24, 1979, Ser. No. 77,931

Int. Cl.[3] D01H *13/32;* G06F *11/32;* H04Q *9/00*

U.S. Cl. 57—265 16 Claims



1. In apparatus for displaying information regarding the operating conditions of a group of ring spinning machines in a textile mill wherein each machine has instrumentalities from which strand material issues and by which strand material is formed into packages during winding thereof, and detectors on each machine for signalling occurrences of events characteristic of certain operating conditions of the machines, and wherein the apparatus has at least one traveling unit supported for travel along a predetermined path for traversing one or more of the machines, and detectors mounted on the traveling unit for monitoring ends of strand material normally being formed by a traversed machine, and further wherein the apparatus has a data system responsive to the detectors on each machine and on the traveling unit for determining said operating conditions of each machine of the traversed group of machines, the improvement in the data system which comprises:

input means for entering a request for display of information characteristic of a selected individual operating condition of a selected individual spinning machine, and

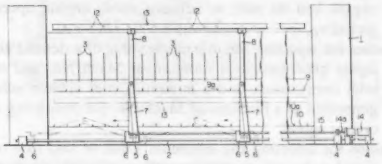
output means for displaying requested information in response to entry of a request through said input means.

4,294,067

METHOD AND APPARATUS FOR DOFFING AND DONNING BOBBINS IN A SPINNING MACHINE

Shuji Takahisa, Toyota; Osamu Suzuki, Ohbu, and Michio Shibano, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jan. 22, 1980, Ser. No. 114,361
Claims priority, application Japan, Jan. 25, 1979, 54-8023
Int. Cl.[3] D01H 9/08, 9/02
U.S. Cl. 57—274 7 Claims



1. An apparatus for removing full bobbins from a succession of spindles of a spinning machine and applying empty bobbins to the spindles from which the full bobbins have been removed, said apparatus comprising:

bobbin conveying means extending along the side of the spinning machine;

means disposed between the succession of spindles and said bobbin conveying means and along the side of the spinning machine for temporarily receiving the bobbins;

a tiltable and vertically movable doffing bar extending along the side of the spinning machine;

a succession of bobbin holders supported by said doffing bar so as to be arranged at the same intervals as the spindles;

means for tilting and means for vertically moving said doffing bar so that said bobbin holders supported by said doffing bar can operate on the spindles, said bobbin temporary receiving means and said bobbin conveying means;

said tilting means including a first piston and cylinder assembly with a reciprocating piston rod, and a mechanism connected between said piston rod and said doffing bar for converting reciprocating movement of said piston rod to tilting movement of said doffing bar between opposite end positions and an intermediate position;

means for maintaining said doffing bar at said intermediate position whereat said bobbin holders can operate on the bobbins on said bobbin temporary receiving means, said maintaining means including an engaging member mounted on a portion of said converting mechanism, and a second piston and cylinder assembly having a stop selectively movable into a path, along which said engaging member is moved by said first piston and cylinder assembly, to allow said engaging member to pressure contact with said stop, thereby stopping said doffing bar at said intermediate position; and

means for supplying fluid into said first piston and cylinder assembly so as to cause said engaging member to be disengaged from said stop in the path of said engaging member before said stop is moved out of the path of said engaging member in order to release said doffing bar from said intermediate position.

4. A method for removing full bobbins from a succession of spindles of a spinning machine and applying empty bobbins to the spindles from which the full bobbins have been removed, the spinning machine including a bobbin doffing and donning apparatus, said method comprising:

projecting a stop into a path along which an engaging member, mounted on a portion of a power transmission mechanism structurally associating a doffing bar with a piston and cylinder assembly for tilting said doffing bar, is moved by said piston and cylinder assembly to allow said engaging member to pressure contact against said stop, thereby stopping said doffing bar at an intermediate inclined position in which said doffing bar operates on a refuge support;

releasing said doffing bar from said intermediate inclined position by temporarily supplying fluid into said piston and cylinder assembly so as to move said engaging member in a direction in which it disengages from said stop; and

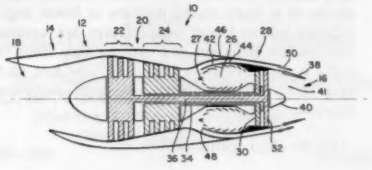
thereafter moving said stop out of the path of said engaging member.

4,294,068

SUPERSONIC JET ENGINE AND METHOD OF OPERATING THE SAME

Garry W. Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 27, 1978, Ser. No. 890,364
Int. Cl.[3] F02K 3/02
U.S. Cl. 60—204 30 Claims



1. A supersonic jet engine adapted to cruise at supersonic speeds at a relatively high efficiency, to operate with turbine inlet temperatures of at least 2500° F. for high power operation, and to cruise subsonically with a relatively low specific fuel consumption, said engine comprising:

a. a housing structure having an upstream inlet end to receive intake air, and a downstream exhaust end to discharge jet exhaust,

b. an air inlet arranged to receive intake air at subsonic velocity and also to receive intake air at supersonic velocities and reduce said air to subsonic velocity,

c. a compressor mounted in said housing rearwardly of said inlet and arranged to compress air flowing into said inlet, said compressor having an inlet end and an outlet end arranged to operate between a maximum compression ratio and a minimum compression ratio,

d. means defining a combustion chamber mounted in said housing downstream of said compressor to receive compressed air therefrom,

e. fuel injection and ignition means in said combustion chamber arranged to burn fuel in air flow from the compressor and provide a gaseous flow from said combustion chamber,

f. a turbine mounted in said housing rearwardly of said combustion chamber and arranged to receive said gaseous flow from the combustion chamber at temperatures at least as high as 2500° F. and also at lower temperatures, said turbine being operatively connected to said compressor to drive said compressor, said turbine having a predetermined cross-sectional nozzle area through which said gaseous flow passes to pass rearwardly through a primary exhaust passageway,

g. a variable area exhaust nozzle to receive gaseous flow from said turbine and exhaust said flow to produce a thrust,

h. turbine bypass means to receive flow from a location downstream of said compressor as bypass flow, and to direct said bypass flow along a path bypassing said turbine, and exhaust said bypass flow from said engine to produce a thrust,

i. bypass valve means to control the amount of flow bypassed into said turbine bypass means,

j. engine control means operatively connected to said fuel injection and ignition means, to said bypass valve means

and to said exhaust nozzle, in a manner to control the amount of fuel directed to said fuel injection and ignition means, to control said bypass valve means in a manner to control the amount of bypass flow through said turbine bypass means, and to control the discharge area through said exhaust nozzle,

k. said turbine being matched to said compressor in a manner that with said engine operating at subsonic cruise velocity, with said compressor operating at maximum compression ratio, with said bypass valve means positioned so that there is substantially no flow through said turbine bypass means, and with fuel flow being adequate to create thrust to match airplane drag at said subsonic cruise velocity, the turbine has a flow area sized to allow gaseous flow therethrough at the speed of sound in said gaseous flow,

l. said engine control means being arranged to set said bypass valve means at a more open position at higher engine thrust settings where higher temperatures are created in said combustion chamber, and to set said bypass valve means at a more closed position at lower engine thrust settings where lower temperatures are created in said combustion chamber, in a manner that there is substantially constant corrected gaseous flow into said turbine, said corrected flow being measured according to the formula:

$$(W\sqrt{\theta+}/\delta+)=\text{corrected flow}$$

where:

W=Total mass flow rate in lbs. per second

$\theta+$=Observed temperature (absolute) divider by standard temperature (518.67° R)

$\delta+$=Observed pressure divided by standard pressure (2116.22 lbs./sq. ft.)

whereby during subsonic cruise said engine can operate at a relatively low specific fuel consumption with high compression ratio and low combustion exit temperature, in a condition where said valve bypass means is at a substantially closed position, during high power acceleration mode said engine can operate at high combustion exit temperatures in a condition where said valve bypass means is in a more open position to maintain constant corrected flow through said turbine to satisfy the turbine requirements, and during supersonic cruise mode the engine can operate efficiency at relatively high combustion exit temperatures.

4,294,069

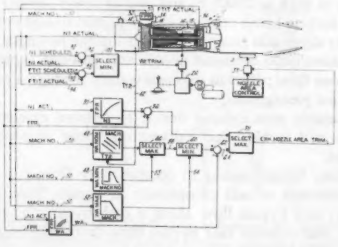
EXHAUST NOZZLE CONTROL AND CORE ENGINE FUEL CONTROL FOR TURBOFAN ENGINE

Vann T. Camp, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 26, 1978, Ser. No. 900,384

Int. Cl.[2] F02K *11/00*; F02C *9/04*

U.S. Cl. 60—238 **2 Claims**



1. A system for optimizing thrust of a gas turbine engine for powering aircraft having a variable area exhaust nozzle while maintaining airflow through the engine within its stable limits, and having independent fuel control means and independent nozzle area control means comprising:

means responsive to rotational speed of said engine for generating a signal for a desired engine pressure ratio,

means responsive to actual pressure ratio for producing a signal indicative of the error between the actual pressure ratio and desired pressure ratio signal,

nozzle area actuator means controlled by said independent nozzle area control responding to said error to further adjust the area of the exhaust nozzle,

means for maintaining the proper amount of airflow in the engine and its inlet to achieve stable engine operations including,

means for selecting the maximum value of a desired airflow signal generated as a function of Mach No. and engine inlet temperature and a minimum inlet airflow schedule generated as a function of Mach No. for producing a first output signal,

means for selecting the minimum value of said first output signal and a maximum inlet airflow schedule generated as a function of Mach No. for producing a second output signal,

means for measuring the airflow in said engine for producing an airflow signal,

means summing said second output signal and said airflow signal for producing an error for further adjusting said exhaust nozzle area,

a maximum selector for selecting the higher value of said error of said pressure ratio signal and said error of said airflow signal,

and means for trimming the independent fuel control means as a function of the difference between a scheduled engine rotational speed and the actual engine rotational speed.

4,294,070

MASTER CYLINDER ASSEMBLIES

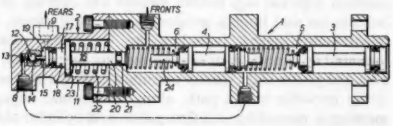
Glyn P. R. Farr, Leek Wootton, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 29, 1979, Ser. No. 89,103

Claims priority, application United Kingdom, Nov. 2, 1978, 42910/78

Int. Cl.[3] B60T *17/22*

U.S. Cl. 60—534 **10 Claims**



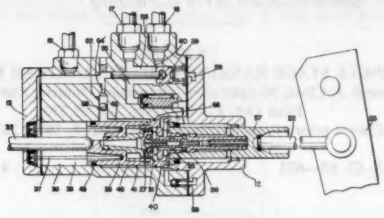
1. A master cylinder assembly for a vehicle braking system having two pressure circuits, comprising a master cylinder, two pistons working in said cylinder and defining two separate pressure chambers, one chamber being arranged for connection to one of said pressure circuits, and a control valve means fast with the master cylinder, said control valve means having an inlet for connection to the other of said chambers and an outlet for connection to the other of said pressure circuits, a normally-open valve for controlling communication between said inlet and said outlet, and an auxiliary piston assembly movable to open and close said valve, wherein the auxiliary piston assembly has two portions, one portion being subjected to the pressure at said outlet of said valve arrangement and the other portion being subjected to the pressure of said one chamber of said master cylinder and being engageable by an adjacent one of said pistons of the master cylinder, in the event of failure of pressure in said one pressure circuit, whereby said piston assembly is moved to a position in which said valve is held open.

4,294,071

HYDRAULIC BOOSTER TRAVEL RATIO CHECK VALVE

Kenneth D. Jensen, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 12, 1979, Ser. No. 102,883
Int. Cl.³ B60T *13/00, 11/20*
U.S. Cl. 60—547 A 16 Claims



1. A hydraulic booster comprising:
a housing having an input end and an output end, the housing having a housing inlet, a housing outlet and a low pressure outlet;
a control valve means, within the housing, having an inlet valve and an exhaust valve;
an input means through the input end, the input means being operatively connected to the control valve means;
a gain valve means in communication with a passage from the housing inlet to the housing outlet, at a gain valve gap;
a power piston chamber on the output end side of the inlet valve of the control valve means, the power piston chamber connected through the inlet valve to the passage from the housing inlet to the gain valve gap;
power piston slidingly located with a power piston bore in the housing between the power piston chamber and the output end;
a slave piston slidingly located within a slave piston bore in the housing between the power piston and the output end;
an output means from the output end operatively connected to the slave piston;
a ratio chamber within the housing between the slave piston and power piston, there being a passage between the ratio chamber and the low pressure outlet;
a check valve means disposed in the passage between the ratio chamber and the low pressure outlet and designed to allow fluid, under pressure, to flow through the passage in only one direction towards the ratio chamber, the check valve being designed to prevent the loss of fluid from the ratio chamber when the power piston moves in the direction of the output means.

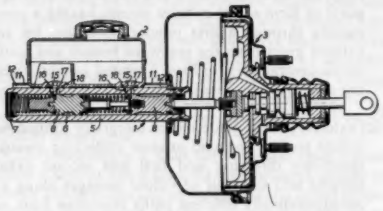
4,294,072

MASTER CYLINDER AND RESERVOIR ASSEMBLIES

Derek J. Flynn, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 28, 1979, Ser. No. 80,065
Claims priority, application United Kingdom, Oct. 4, 1978, 39336/78
Int. Cl.³ B60T *11/26*
U.S. Cl. 60—585 4 Claims

1. A master cylinder and reservoir assembly comprising an elongate master cylinder having a longitudinal axis and longitudinally extending recesses thereon, a reservoir having cooperating projections complementary to said recesses, said projections and recesses being so arranged as to permit interconnection of said reservoir and master cylinder by relative sliding movement in a direction generally parallel to said longitudinal axis of said master cylinder, said projections being formed on a foot portion of the reservoir, said foot portion having an aperture therethrough which cooperates with an aperture in the master cylinder wall to create a flow path between the reservoir and master cylinder, said foot portion having an extension and a downwardly extending lug on said extension engageable with a complementary hole in said master cylinder to locate



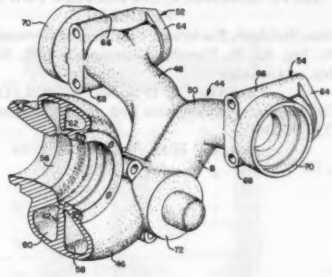
and retain said reservoir in a desired predetermined position on said master cylinder.

4,294,073

INTEGRAL TURBINE HOUSING AND EXHAUST COLLECTOR SECTION

Joseph J. Neff, Zionsville, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Oct. 5, 1979, Ser. No. 82,284
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—597 20 Claims



1. A turbine housing for use on a multi-cylinder internal combustion engine having plural exhaust ports formed in the engine head/block assembly generally aligned from front to rear and a multi-branch exhaust manifold having a forward branch connected with at least one forward exhaust port for directing exhaust gases generally rearwardly and a rearward branch connected with at least one rearward exhaust port for directing exhaust gases generally forwardly, the rearward and forward branches terminating short of at least a pair of centrally located exhaust ports, wherein said turbine housing comprises:
(a) a volute section containing a central opening for receiving a rotatable turbine wheel having a rotational axis coincident with the central axis of the central opening and parallel to the first and second axis of the forward and rearward branches when the turbine housing is operatively mounted on the internal combustion engine and containing a pair of substantially isolated, side-by-side volute passages communicating with said central opening for receiving exhaust gases supplied by the forward and rearward branches, respectively, and for delivering exhaust gases to the turbine wheel substantially 360° around the periphery thereof, each said volute passage having an outermost wall which intersects a plane perpendicular to the central axis of the central opening to define a curved line beginning at the commencement point of each said volute passage and continuing around said central axis at

a radial distance from the central axis of the central opening which continually decreases;

(b) exhaust collecting means for receiving exhaust gases from the forward branch and one of the central exhaust ports to form a first exhaust stream having a central axis passing through a first joinder point and for receiving exhaust gases from the rearward branch and another one of the central ports to form a second exhaust stream having a central axis passing through a second joinder point; and

(c) exhaust stream guide means integrally formed with said volute section and said exhaust collecting means for respectively directing said first and second exhaust gas streams into said pair of volute passages along a pair of aerodynamically efficient paths extending from said first and second joinder points to said first and second commencement points, said exhaust stream guide means including first and second guide passages which respectively extend between said first and second joinder points and said first and second commencement points to define said pair of aerodynamically efficient paths, each said guide passage having a central axis curved at each point along the entire length thereof such that said first and second exhaust gas streams upon passing said first and second joinder points move in continuously curving fashion until reaching the turbine wheel.

4,294,074

DRIVE ASSEMBLY, ESPECIALLY FOR MOTOR VEHICLES

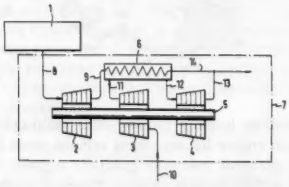
Helmut Striebich, Karlsruhe, Fed. Rep. of Germany, assignor to Dr. Ing. h.c. F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 972,211

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1977, 2757236

Int. Cl.[3] **F01K** *23/10;* **F02C** *1/04*

U.S. Cl. 60—616 **9 Claims**



1. A drive assembly, especially for motor vehicles, of the type comprising an internal combustion engine and an exhaust gas turbine unit including an exhaust gas turbine driven by the exhaust gases of the internal combustion engine, a compressor, and a secondary turbine, interconnected with each other, the improvement comprising means for utilizing both the kinetic energy and the heat energy of the exhaust gases of the internal combustion engine by a thermal work process superimposed in said exhaust gas turbine, wherein said means for utilizing comprises said exhaust gas turbine having hollow blade means fluidicly communicating with said compressor and secondary turbine for passing a working medium compressed by the compressor therethrough to said secondary turbine with said medium being in heat exchange relationship with the exhaust gases while in said hollow blade means, and expanding in the secondary turbine and releasing power, and wherein said exhaust turbine unit further comprises:

a housing and a hollow rotatable shaft supported therein,

said compressor and turbines being mounted upon said shaft within said housing,

an exhaust gas line being connected to a first inlet of said housing,

said first inlet communicating the exhaust gases with the interior of said shaft through at least one aperture formed therein,

first outlet means for the discharge of said exhaust gases from said shaft and housing, and

working medium passage means for passing said working medium into said compressor, from said compressor to secondary turbine in heat transfer relationship with said exhaust gases and out of said housing.

4,294,075

SINGLE STAGE RANKINE AND CYCLE POWER PLANT

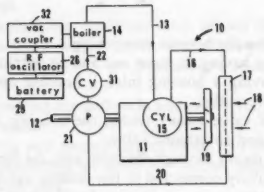
Joseph J. Closs, 36 Jade cres., Brampton, Ontario, Canada

Filed Oct. 17, 1979, Ser. No. 85,533

Claims priority, application Canada, Dec. 7, 1976, 267281

Int. Cl.[3] **F01K** *25/00*

U.S. Cl. 60—671 **4 Claims**



1. An improved Rankine cycle power plant of the freon gas energy type and comprising a Rankine engine having a gas energy inlet line and an exhaust line and a power output shaft for said engine;

a freon boiler having an upper cathode grade and a lower end element spaced therefrom, said anode being substantially immersed in liquid freon in said boiler, and gaseous energy inlet line of said engine communicating to said boiler above the liquid freon level therein; a radio frequency oscillator and a battery source energizing same and means communicating radio frequency energy from said oscillator to said cathode and anode; an air communicating heat exchanger adapted to conduct exhaust gases from said exhaust line for liquification of said gases in said heat exchanger; a liquid pump driven by said power output shaft and delivering liquified gases from said heat exchanger to said boiler at the pressure of said boiler at least; and a fan driven by said power output shaft adapted to draw ambient air through said heat exchanger.

4,294,076

ABSORPTION REFRIGERATING SYSTEM

Kazuhiro Yoshii, Gunma, Japan, assignor to Sanyo Electric Co. Ltd., Moriguchi and Tokyo Sanyo Electric, Ora, both of, Japan

Filed May 20, 1980, Ser. No. 151,610

Claims priority, application Japan, May 30, 1979, 54-67630; Feb. 20, 1980, 55-20979

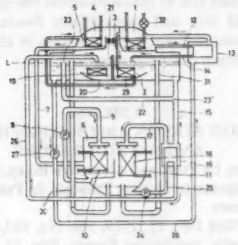
Int. Cl.[3] **F25B** *27/00, 15/00*

U.S. Cl. 62—235.1 **4 Claims**

1. In an absorption refrigerating system which comprises a main generator constituted by a high temperature generator to evaporate and separate a refrigerant from an absorbent with vapor, high temperature water, combustion gas or the like being utilized as a heat source, and a low temperature generator to separate a refrigerant from the absorbent with the refrigerant evaporated in said high temperature generator being utilized as a heat source; an auxiliary generator to separate a refrigerant from the absorbent with solar heat or low temperature level warm water such as warm waste water being utilized as a heat source; a condenser; an evaporator; an absorber or others; and in which said devices above-mentioned are con-

nected by refrigerant lines and absorbent lines to form the circulation cycles of the refrigerant and the absorbent,

the improvements characterized in that said auxiliary generator and said low temperature generator are separately housed in a common housing such that a same level pressure is applied to said auxiliary generator and said low temperature generator and such that the absorbents in said auxiliary generator and said low temperature generator are not mixed with each other, and in that there is disposed an absorbent line for connecting said absorber to said auxiliary generator and there is also disposed an absorbent pump at the absorbent line for connecting said auxiliary generator to said main generator, whereby when a double-effect operation is performed with said low temperature generator operated, said absorbent pump is adapted to be operated, and when a single-effect operation is performed with said low temperature generator stopped operating, said absorbent pump is adapted to be stopped operating.



4,294,077

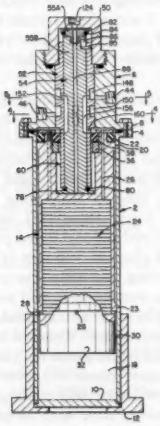
CRYOGENIC REFRIGERATOR WITH DUAL CONTROL VALVES

Domenico S. Sarcia, Carlisle, Mass., assignor to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.

Filed Oct. 29, 1979, Ser. No. 89,271

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **35 Claims**



1. In a cryogenic refrigerator in which a movable displacer means defines within an enclosure first and second chambers of variable volume, and in which a refrigeration fluid is circulated in a fluid flow path between said first chamber and said second chamber by the movement of said displacer means controlled through the introduction of high-pressure fluid and the discharge of low-pressure fluid, the improvement which comprises in combination:

valve support means connected to said enclosure;

a valve supported by said valve support means, said valve having a high-pressure inlet port, a low-pressure outlet port, and a bi-directionally movable valve member having first and second passages arranged so as to alternately connect said inlet and outlet ports to said first chamber according to the position of said valve member;

a third variable volume chamber defined in part by said displacer means; and

means for transmitting a fluid between said third variable volume chamber and a selected high pressure source or a selected low pressure source independently of the mode of fluid flow determined by the connections made by said valve member between said inlet and outlet ports and said first chamber.

4,294,078

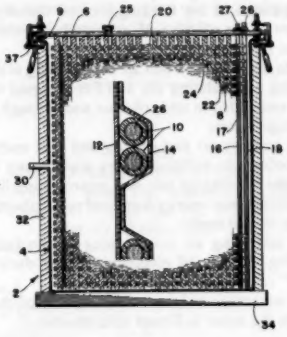
METHOD AND SYSTEM FOR THE COMPACT STORAGE OF HEAT AND COOLNESS BY PHASE CHANGE MATERIALS

Calvin D. MacCracken, Englewood, N.J., assignor to Calmac Manufacturing Corporation, Englewood, N.J.

Continuation-in-part of Ser. No. 790,919, Apr. 26, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 923,984

Int. Cl.³ F28D *21/00*; F25B *23/00*

U.S. Cl. 62—59 **36 Claims**



7. The method of storing thermal energy and withdrawing it at a later time comprising the steps of:

A. providing a plastic open-top container;

B. uniformly spacing a grid of small diameter plastic tubes within and substantially throughout said container;

C. arranging said tubes to give multiple parallel circuits with opposite direction of flow in adjoining tubes;

D. connecting said tubes to supply and return headers;

E. substantially filling said container and surrounding said tubes with a phase change material in its liquid state while leaving a region in the top of said container which is free of said phase change material for accommodating the expansion and contraction of said material during its change of state;

F. connecting said headers through pumping and heat exchange means;

G. recirculating a liquid through said tubes at a temperature below the phase change temperature causing the phase change material to solidify; and

H. alternately adding heat energy to and withdrawing heat energy from the recirculating liquid causing said material to melt and solidify simultaneously throughout the mass of said phase change material, whereby heat of fusion will be stored simultaneously throughout the phase change material during solidification and then released to the recircu-

lating liquid simultaneously throughout the phase change material during melting.

36. The method for freezing ice solid in a vertical cylindrical plastic tank without creating lateral expansion forces in the tank for cooling storage for use in air conditioning a building using electrical energy at "off peak" rates including the steps of:

uniformly spacing a grid of small diameter spaced flexible plastic tubes within and substantially throughout the tank in the main lower portion of said tank;

arranging said tubes to give multiple parallel circuits with opposite direction of liquid flow in adjoining tubes;

connecting said tubes to supply and return headers;

filling said tank with water in the main lower portion of said tank while leaving the top portion of the tank free of water to accommodate expansion as the water is frozen into solid ice in the tank;

connecting said headers through electrically energized pumping and refrigeration means located outside of said tank and arranged for refrigerating anti-freeze liquid;

electrically energizing said pumping and heat exchange means during "off peak" hours of a 24 hour day for recirculating the anti-freeze liquid through said tubes at a temperature below the freezing point of water for causing the water in said plastic tank to freeze to solid ice around all of said adjoining tubes uniformly throughout the whole volume of water in said tank during said "off peak" hours;

said freezing of the water to solid ice around all of said adjoining tubes throughout the whole volume of water in said tank squeezing the extra water volume upwardly due to expansion of the freezing ice and thereby preventing rupture of the plastic tank as the whole volume of water freezes to solid ice;

during daylight hours when air conditioning is desired in the building recirculating the anti-freeze liquid through said tubes embedded in said solid ice and through second heat exchange means;

blowing building air past said second heat exchange means for cooling the building air by transferring heat energy from the building air into said recirculating liquid and for transferring heat energy from said recirculating liquid into the ice in said tank;

thereby providing air conditioning in the building while avoiding the use of electrical energy during hours of "peak" rates, and

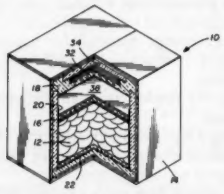
thereby advantageously avoiding rupture of the tank even though the water is frozen solid therein.

4,294,079

INSULATED CONTAINER AND PROCESS FOR SHIPPING PERISHABLES

Ernest J. Benson, Berkeley Heights, N.J., assignor to Better Agricultural Goals Corporation, Dallas, Tex.

Filed Mar. 12, 1980, Ser. No. 129,565
Int. Cl.[3] B65B *63/08*; F25D *3/08*
U.S. Cl. 62—60 **20 Claims**



1. A process for packing perishables for shipment, comprising the steps of:

(a) chilling the perishables to a desired predetermined unfrozen temperature;

(b) placing the prechilled perishables on an absorbent pad within an insulated box;

(c) covering the prechilled perishables with a layer of ice;

(d) placing a wet pad on the layer of ice;

(e) closing the top end of said box with a lid positioned in spaced relationship with said wet pad in order to define a head space therebetween; and

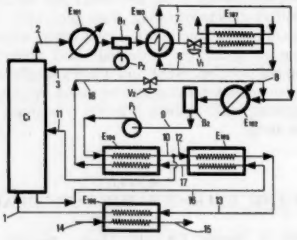
(f) connecting a compartment containing subliming expendable refrigerant in fluid communication with the head space of said box so that sublimated refrigerant can refrigerate said box and substantially freeze said wet pad, thereby maintaining the perishables in chilled but unfrozen condition during shipment.

4,294,080

DESORPTION STEP IN ABSORPTION HEAT PUMPS AND REFRIGERATORS

Georges Cohen, Le Pecq, and Alexandre Rojey, Garches, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 11, 1979, Ser. No. 102,489
Claims priority, application France, Dec. 11, 1978, 78 35010
Int. Cl.[3] F25B *15/00*
U.S. Cl. 62—101 **18 Claims**



1. An improved process for operating an absorption heat pump or an absorption refrigerator, the improvement comprising the steps of:

(a) directly contacting a solute vapor phase (V″) with a liquid phase (L′) and a liquid phase (L″) in an absorption zone, the liquid phases (L′) and (L″) being solvents for the solute vapor phase (V″), thereby recovering a solution (S);

(b) dividing the recovered solution (S) into a first portion (S_1) and a second portion (S_2), supplying said first portion (S_1) of the solution (S) to an indirect contact heat exchange zone and indirectly contacting said portion (S_1) with an external heating fluid in said indirect contact heat exchange zone, thereby recovering a vapor phase (V′), and a residual liquid phase (L′), separating said vapor phase (V′) from said residual liquid phase (L′) and feeding back said liquid phase (L′) to step (a);

(c) directly contacting, in counter-current contact, the vapor phase (V′) from step (b) with said second portion (S_2) of the solution (S) in a desorption zone, thereby recovering separately a vapor phase (V) and a liquid phase (L″) and feeding back said liquid phase (L″) to step (a);

(d) passing the vapor phase (V) from step (c) through a condensation zone, externally cooling the vapor phase (V) in said condensation zone with an external cooling fluid and recovering a condensed phase (C); and

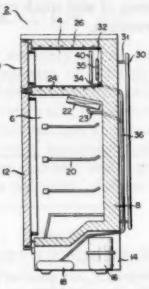
(e) passing said condensed phase (C) through an evaporation zone, externally heating said evaporation zone with an external heating fluid to vaporize at least a portion of said condensed phase (C), recovering a vapor phase (V″) therefrom, and feeding back said vapor phase (V″) to step (a).

4,294,081

FREEZING REFRIGERATOR

Akio Mitani; Moriyoshi Sakamoto, both of Yokohama, and Hiroaki Murasaki, Ibaraki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 27, 1979, Ser. No. 33,978
Int. Cl.³ F25D *21/02*; F25B *5/00*
U.S. Cl. 62—140 **8 Claims**



1. A freezing refrigerator comprising:
a freezing chamber for storing an object to be frozen, said freezing chamber defined by contiguous top, bottom, side and rear walls and including an opening for taking the object in or out of said chamber;
a freezing chamber door member provided at the opening which is opened or closed when the object is taken in or out of said freezing chamber and for intimately closing said freezing chamber when said door member is closed;
a first cooling means which is provided at the periphery around the top, bottom and side walls of said freezing chamber to cool said freezing chamber;
a second cooling means which is disposed close to the rear wall of said freezing chamber;
a shield which is disposed between said second cooling means and said door and close to said second cooling means and is made of a heat insulative material, said shield substantially open around its periphery;
a heating means for melting frost attached to said second cooling means; and
coolant supply means for supplying a coolant to said first and second cooling means to produce a temperature differential therebetween such that the surface temperature of said second cooling means is lower than that of said first cooling means;
wherein said shield defines a defrost region between said shield and said rear wall, said defrost region communicating with the rest of said freezing chamber around the periphery of said shield, whereby frost deposited on the first cooling means is migrated by air convection past said shield towards said second cooling means in said defrost region.

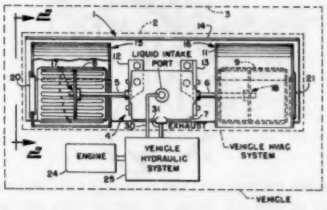
4,294,082

HYDRAULIC BLOWER SYSTEM FOR VEHICLES

Patrick L. Gerboth, Concord Township, Lake County, and Charles W. Thompson, Willoughby, both of Ohio, assignors to SGM Co., Inc., Mentor, Ohio

Filed Mar. 13, 1979, Ser. No. 20,075
Int. Cl.³ B60H *3/04*
U.S. Cl. 62—244 **6 Claims**

1. For a vehicle including a hydraulic system for operating hydraulic equipment associated with the vehicle, and a prime mover for driving the hydraulic system to provide work thereto, the improvement comprising hydraulic blower means for blowing air in the vehicle to circulate air therein, and means for coupling hydraulic fluid of the hydraulic system to said hydraulic blower means to operate said hydraulic blower means to blow air in the vehicle; said hydraulic blower means including a hydraulic motor having an output shaft on one side of said hydraulic motor and another output shaft on an opposite side of said hydraulic motor and blower means for blowing air, said output shafts being commonly rotated, said blower means including a separate squirrel cage blower mounted on each of said output shafts, and blower housing means about said squirrel cage blowers for at least partly covering said



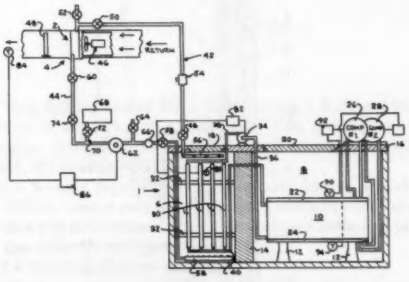
squirrel cage blowers; the vehicle including an air conditioning system having a condenser with a condenser coil, said hydraulic blower means being mounted with respect to the condenser to circulate air over the condenser coil; said output shafts providing the sole support for said squirrel cage blowers; said blower housing means having inlet means and outlet means for air flow with respect thereto; and further comprising blower system housing means for supporting said hydraulic motor and said blower housing means in the vehicle.

4,294,083

AIR CONDITIONING SYSTEM

Barton King, 19415 W. Indies La., Tequesta, Fla. 33458

Filed Apr. 7, 1980, Ser. No. 137,870
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—434 **9 Claims**



1. An air conditioning system having a freeze tank, a first coolant tank positioned within said freeze tank, means for freezing a liquid in said freeze tank around said first coolant tank and cooling a liquid in the first coolant tank to a desired temperature, a second coolant tank, heat absorber plates being positioned within said second coolant tank, means connecting said first coolant tank to said heat absorber plates for pumping a cooled liquid in the first coolant tank through said heat absorber plates and back into said first coolant tank, an evaporator coil, means connecting said second coolant tank to said evaporator coil for pumping a cooled liquid in the second coolant tank through said evaporator coil and back into said second coolant tank.

4,294,084

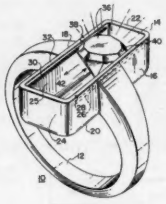
ARTICLE OF JEWELRY WITH RECIPROCALLY MOVABLE GEM

Lester M. Lampert, 2304 Greenview Rd., Northbrook, Ill. 60048

Filed Aug. 19, 1976, Ser. No. 715,987

Int. Cl.³ A44C *9/00, 17/02*

U.S. Cl. 63—15 **9 Claims**



9. An article of jewelry comprising a setting and at least one stone carried in said setting wherein the setting comprises guide means slidably holding said stone, said stone having a top side and a bottom side and being adapted to move in said guide means upon random tilting of said setting while being constrained by said guide means to movement in a linear path with said top side maintained uppermost in said setting.

4,294,085

FLAT BED KNITTING MACHINES

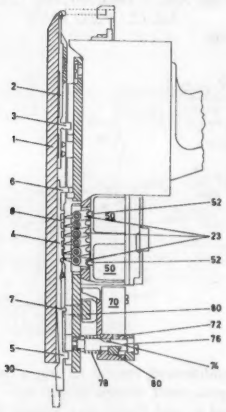
Johann G. Traütner, Creussen, Fed. Rep. of Germany, assignor to Bentley Alemannia Limited, Great Britain

Filed Oct. 2, 1979, Ser. No. 81,113

Claims priority, application United Kingdom, Oct. 3, 1978, 39031/78

Int. Cl.³ D04B *7/00*

U.S. Cl. 66—75.1 **25 Claims**



1. Flat bed knitting machines having a pair of needle beds, tricks in said needle beds, needles and jacks in the respective tricks and having associated operating butts extending outwards of the tricks, said needle operating butts being non-rotatable, a cam carriage, means for sliding said cam carriage across said needle beds, cam means including clearing cam means and stitch cam means on said cam carriage defining for said needle operating butts in each direction of carriage movement a collecting track, a knitting track and a tucking track, a first bank of actuators for selectively engaging said jacks to cause selected needle operating butts to be raised lengthwise of the tricks from the collecting track for passing through the knitting track by means of said clearing cam means and said stitch cam means, a second bank of actuators spaced in trickwise alignment with said clearing cam means and housing on either side thereof cam means for raising the needle operating butts from the collecting track lengthwise of the tricks on the trailing side of said clearing cam means for passing through the tucking track by means of said stitch cam means in each direction of carriage movement.

4,294,086

LATCH NEEDLE FOR KNITTING MACHINES

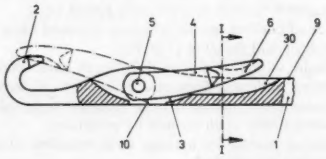
Harald Mayer, and Hardo Berentzen, both of Albstadt, Fed. Rep. of Germany, assignors to Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft, Albstadt, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,587

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714607

Int. Cl.³ D04B *35/04*

U.S. Cl. 66—121 **1 Claim**



1. A latch needle for knitting or like machines comprising:

an elongated needle shank having an upper edge and a lower edge, and a hook at at least one end thereof and a longitudinally-extending slot formed therein flanked by a pair of opposed faces, and a latch pivotably mounted in said slot and having a spine with a widened wedge-like, rounded portion, said needle shank having a supporting portion for the widened, rounded portion of the spine of the latch at the faces of said shank flanking said longitudinal slot and said supporting portion being recessed relative to the upper edge of said needle shank, said longitudinal slot having a short recessed portion defined by a curved base wall containing an aperture leading to the lower edge of said needle shank and a further portion adjacent to said short portion which defines a channel characterized by an initial substantially rectilinear base wall and a further curved base wall which merges with said upper edge of the needle shank, said supporting portion of said needle shank for said widened, rounded portion of the spine of the latch being located over the substantially rectilinear base wall region of said further portion and said channel of said further portion being deeper than half the height of said needle shank in said substantially rectilinear base wall region and projecting in length beyond the end of said latch when in its rearward open position displaced away from its associated hook.

4,294,087

ENZYMATIC METHOD FOR HAIR RECOVERY WITH CONCURRENT OPENING OF HIDE STRUCTURE

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Apr. 2, 1980, Ser. No. 136,678

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1979, 2917376

Int. Cl.³ C14C *1/06*

U.S. Cl. 69—21 **13 Claims**

1. A method for the recovery of hair from an animal hide and for a concurrent opening of the hide structure using a proteolytic enzyme, which method comprises first pretreating the hide, free of preservative salt, in the acid pH region with a material cleaving disulfide bridges and then, without a previous softening, concurrently loosening hair and opening the hide structure by treating said hide with a protease, effective in the alkaline region, at a pH value of about 11 to about 13.

4,294,088

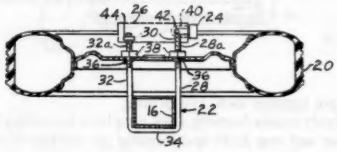
SECURITY DEVICE FOR SPARE TIRES

Rolla W. Barr, 16300 Fontaine Dr., Chesterfield, Mo. 63017

Filed Oct. 16, 1978, Ser. No. 951,757

Int. Cl.³ B60R *43/00, 43/02;* **E05B** *67/38, 73/00*

U.S. Cl. 70—56 **4 Claims**



1. A security device for spare tires comprising:

a housing having first means for receiving a shackle portion of an associated padlock, and second means for receiving a first portion of an associated member to be secured by the padlock, said first means being a relief adjacent one end of the housing and said second means being a relief opposite the first relief and adjacent the one end;

shackle-securing means connected to the housing adjacent the one end;

third means for receiving a second portion of the associated member, said third means being a relief adjacent another end of the housing opposite the one end; and

means for manual access to the shackle, said means being an opening formed in the housing between the opposite ends.

4,294,089

LATCHBOLT RIM LOCK

Walter E. Best, and William R. Foshee, both of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed Nov. 30, 1978, Ser. No. 965,185

Int. Cl.³ E05B *55/00*

U.S. Cl. 70—150 **16 Claims**

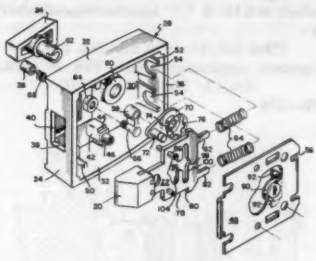
1. A rim lock, comprising

a case having a front wall and side and end walls,

a latchbolt including a head and a draw plate, slidably mounted in the case for movement between a projected locking position and a retracted unlocked position, said draw plate having laterally spaced spring seats at its rear end,

said case having two laterally spaced spring seats formed in its rear end wall, a spring mounted between each spring seat and the rear end of the draw plate and biasing the bolt forward to projected position,

said draw plate having a cam opening therein ahead of said spring seats defining a forwardly presented cam surface, a crank rotatably mounted in the front wall between the positions of the spaced springs, and having a forwardly



offset crank pin engaged in said cam opening and movable against the cam surface to move the bolt to retracted position.

4,294,090

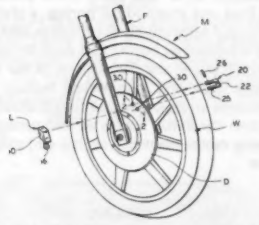
CYCLE LOCK ARRANGEMENT

Romain Metzger, 1310 Roscoe, Chicago, Ill. 60657

Filed Aug. 17, 1979, Ser. No. 67,350

Int. Cl.³ B62H *5/08, 5/18;* **E05B** *67/06, 71/00*

U.S. Cl. 70—226 **9 Claims**



1. In a locking device for a cycle having a fork, a wheel mounted in the fork, and a brake disc, with opening means extending therethrough, secured to said wheel outboardly thereof, the combination of:

(a) a housing member including a body having a cavity therein, open at only one side thereof, and adapted to have said one side mounted against an outboard surface of said disc adajcent said opening means;

(b) a retaining member including:

(i) an inboard portion adapted to be mounted against an inboard surface of said disc adjacent said opening means;

(ii) an integral outboard portion adapted to extend from said inboard portion, through said opening means and into said housing member cavity;

(c) said housing member also including a lock element mounted for movement within said cavity into and out of engagement with the outboard portion of said retaining member to keep said disc snugly positioned between opposed surfaces of said retaining member inboard portion and said housing member body;

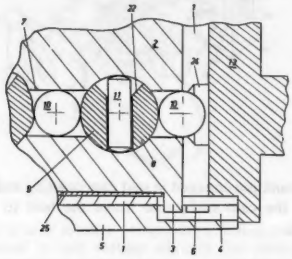
(d) means for moving said lock element into and out of engagement with said retaining member outboard portion.

4,294,091

CONTROL DEVICE FOR CYLINDER LOCKS

Kurt Prunbauer, Herzogenburg, Austria, assignor to Evva Werk Spezialerzeugung von Zylinder- und Sicherheitsschlossern Gesellschaft m.b.H. & Co. Kommanditgesellschaft, Vienna, Austria

Filed Feb. 16, 1979, Ser. No. 12,895
Claims priority, application Austria, Feb. 20, 1978, 1222/78
Int. Cl.[3] E05B *9/04, 47/00*
U.S. Cl. 70—276 **5 Claims**



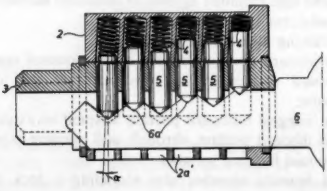
1. A control device, particularly for use in a magnetic cylinder lock, comprising, a housing defining a cylindrical passage, a cylindrical plug disposed in said passage for a rotational and axial movement relative to said housing; arresting means operable between said plug and said housing for blocking the rotational movement in one axial position of said plug and for unblocking the rotational movement in another axial position thereof; said plug having a radial extension and said housing defining an axial groove in engagement with said extension and an annular groove communicating with said axial groove to guide said extension in said other axial position; said plug including at least one longitudinal boring, a plurality of rotary members arranged respectively for rotation about an axis transverse to said longitudinal boring and each defining a diametrical boring which at one angular position of the rotary member is in alignment with said longitudinal boring, a plurality of arresting elements arranged in said longitudinal and diametrical borings over the entire length of said passage in the housing, and biasing means normally urging said plug into said one axial position.

4,294,092

CYLINDER LOCK HAVING SPRING-ACTUATED PINS

Ake T. L. Häggström, Lycksele, Sweden, assignor to GKN-Stenman AB, Eskilstuna, Sweden

Filed Feb. 13, 1980, Ser. No. 120,961
Claims priority, application Sweden, Feb. 13, 1979, 7901266
Int. Cl.[3] E05B *27/04*
U.S. Cl. 70—364 A **4 Claims**



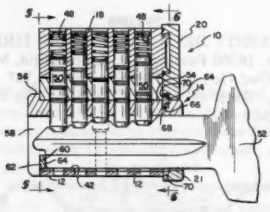
1. A cylinder lock, comprising: a cylinder housing (2), a cylindrical body (3) mounted in said housing for rotation through at least 180° when a correct key is inserted into said lock, said housing and said cylindrical body individually defining a first parallel set and a second parallel set of communicating bores, and a plurality of spring-actuated pins individually accommodated within said first and second sets of bores, each pin comprising at least two parts and inner ends of said pins cooperating with a bit of the key, at least one of said sets of bores being inclined relative to a normal to the axis of the cylinder housing to partially axially offset the first and second sets of bores subsequent to rotating the cylindrical body through 180° and prevent the pin parts within the cylindrical body from falling out.

4,294,093

PIN TUMBLER LOCK WITH PULL-RESISTANT KEY PLUG

Walter E. Best; William R. Foshee, and Max L. Flack, all of Indianapolis, Ind., assignors to Best Lock Corporation, Indianapolis, Ind.

Filed Jun. 14, 1979, Ser. No. 48,531
Int. Cl.[3] E05B *27/00*
U.S. Cl. 70—369 **14 Claims**



1. A pin tumbler lock, comprising
lock body means forming a key plug bore extending between front and rear faces and forming pin tumbler bores intersecting therewith,
a key plug having a cylindrical portion received in said plug bore and containing an axial key slot and pin tumbler bores alignable with those of the body means,
a peripheral flange on said plug integral with said cylindrical portion and disposed in thrust transmitting overlapping relation with the rear of the lock body means so as to oppose forward movement of the key plug,
a circumferential groove in the key plug adjacent its front end and a retainer ring engaged in said groove and disposed in axially engaging relation with the front of the lock body so as to oppose rearward movement of the plug,
said ring having a key-pass opening therein and interengaging the plug so as to be held with its said opening in alignment with the key slot of the key plug.

4,294,094

METHOD FOR AUTOMATICALLY CONTROLLING WIDTH OF SLAB DURING HOT ROUGH-ROLLING THEREOF

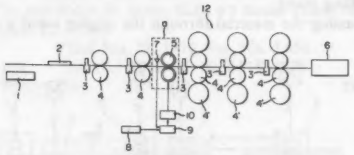
Masaru Okado, Tokyo, and Takashi Ariizumi, Yokohama, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1980, Ser. No. 117,272
Claims priority, application Japan, Feb. 24, 1979, 54-20213
Int. Cl.[3] B21B *1/04, 27/02, 37/00*
U.S. Cl. 72—16 **10 Claims**

1. A method for automatically controlling the width of a slab during hot rough-rolling thereof, which comprises:
arranging a pair of horizontal broadening rolls each having at least one annular projection in a hot roughing mill train comprising a plurality of roll stands each having a pair of vertical rolls and a pair of horizontal rolls;
calculating an amount of roll gap correction of said pair of broadening rolls on the basis of variations in the width of said slab during hot rough-rolling by said hot roughing mill, at the entry of said pair of broadening rolls; and,

controlling the roll gap of said gap of broadening rolls in response to said amount of roll gap correction;

thereby automatically controlling the width of said slab



during hot rough-rolling thereof to a prescribed value in accordance with the finishing width of a steel strip, and at the same time, automatically correcting variations in the width of said slab during hot rough-rolling thereof.

4,294,095

PROCESS FOR FABRICATING HEAVY WALL TO PIPE

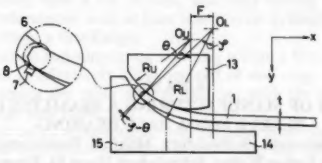
Tsuyoshi Kawano; Matsuo Usuda, and Toshio Hirokawa, all of Kisarazu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Nov. 23, 1979, Ser. No. 97,043

Claims priority, application Japan, Nov. 22, 1978, 53-143325; Feb. 23, 1979, 54-19750

Int. Cl.³ B21D *5/00*

U.S. Cl. 72—51 **10 Claims**



1. A process of fabricating flat steel plate into heavy wall UO pipe by crimping, U-ing and O-ing, wherein the U-ing operation comprises:

using a collapsible U-ing punch comprising a center block carrying paired side punches on both sides and a bottom punch at the bottom thereof; and

obtaining the desired butt edge gap in the O-shaped workpiece by decreasing the ratio of the U-ing punch height to the U-ing punch width when the gap is smaller than the desired butt edge gap, and increasing said ratio when the gap is larger than the desired butt edge gap.

4,294,096

METHOD AND APPARATUS FOR MAKING A SECONDARY KEY FOR A LOCK MECHANISM

Joseph B. Heimann, 502 Marlbrook La., Lansdale, Pa. 19446

Division of Ser. No. 790,824, Apr. 25, 1977, Pat. No. 4,143,582. This application Dec. 11, 1978, Ser. No. 968,198

Int. Cl.³ B21D *33/00*

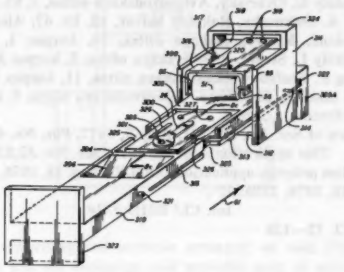
U.S. Cl. 72—60 **9 Claims**

1. Apparatus for recording information relating to a primary key in order to be able to make a secondary key comprising:

(a) a frame of essentially rectangular shape to accommodate the largest key to be recorded;

(b) a support member for supporting said frame in a fixed position, said support member including a rectangular slot of dimensions sized to fit said frame, said slot being of a depth equal to or greater than the height of said frame whereby a key may be placed on the portion of said support member within the area enclosed by said rectangular slot, said portion being coplanar with the rest of said support member;

(c) a piece of metallic foil secured between at least two sides of said frame, said frame with said foil placed over the rectangular portion of said support member enclosed by said rectangular slot, whereby the primary key may be placed under said foil for recording the impression of said primary key in said foil;



(d) an elastic roller mounted on a shaft for applying pressure between said metallic foil and key to press said key and metallic foil together such that the metallic foil is forced into and around indentations on said key, thereby making a recording in said foil;

(e) means to support said shaft for rolling motion over said metallic foil; and

(f) means in said support member for guiding said roller over said foil.

4,294,097

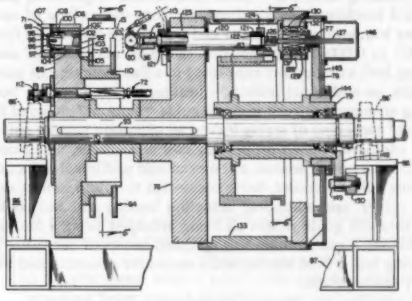
BOTTOM ROLL-FORMING METHOD AND APPARATUS AND RESULTANT CAN END CONFIGURATION

Laszlo A. Gombas, Rte. 7, Box 555Q, Evergreen, Colo. 80439

Division of Ser. No. 931,124, Aug. 4, 1978, Pat. No. 4,199,073. This application Apr. 8, 1980, Ser. No. 138,855

Int. Cl.³ B21D *17/04*

U.S. Cl. 72—94 **23 Claims**



1. The method of roll forming the end wall of a generally cylindrical receptacle composed of a ductile material which is open at one end and is provided with an end wall at the opposite end, the method comprising the steps of retaining each receptacle in succession in a fixed position with the exterior of the unitary end wall in facing relation to the end of a yieldable support and advancing at least one bearing surface axially through the interior of the receptacle into engagement with the end wall and rotating the bearing surface while continuously advancing same in an axial direction whereby to force the end wall into engagement with the yieldable support to roll-form an axially directed, annular rib in the end wall while forcing

the end wall to assume a generally dome-shaped configuration as it is forced against the yieldable member.

4,294,098

APPARATUS FOR MANUFACTURING STEEL SPRING LEAVES

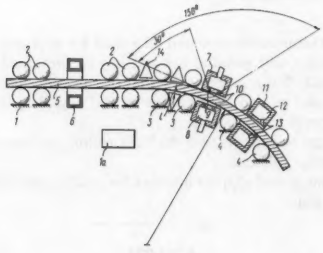
Viktor P. Egorov, Vostryakovsky proezd, 11, korpus 1, kv. 226; Viktor A. Ognevsky, Sumskoi proezd, 15, korpus 2, kv. 279; Anatoly G. Orlovsky, Avtozavodskaya ulitsa, 7, kv. 81; Grigory A. Ostrovsky, Raketny bulvar, 10, kv. 47; Alexandr M. Ryskind, Kirovogradskaya ulitsa, 24, korpus 1, kv. 161; Anatoly L. Stepin, Birjulevskaya ulitsa, 5, korpus 2, kv. 347; Oleg F. Trofimov, Chusovskaya ulitsa, 11, korpus 8, kv. 92, and Isaak N. Shklyarov, Velozavodskaya ulitsa, 9, kv. 24, all of Moscow, U.S.S.R.

Division of Ser. No. 824,211, Aug. 9, 1977, Pat. No. 4,193,824. This application Apr. 26, 1979, Ser. No. 33,520

Claims priority, application U.S.S.R., Aug. 18, 1976, 2385501; Aug. 18, 1976, 2385502

Int. Cl.³ B21D *5/14*

U.S. Cl. 72—128 **1 Claim**



1. An apparatus for manufacturing spring leaves comprising: a support adapted to mount, live entry guide rollers; an induction heating coil, said coil being arranged intermediate said live entry guide rollers and connected to a power source; bending rollers set in pairs for accommodating therebetween a spring leaf; stops disposed between said live entry guide rollers and said bending rollers, as well as between the neighboring pairs of said bending rollers and spaced from the surface of each spring leaf passing in between said rollers, at a distance of from 0.0001 to 0.00005 of a specified radius of curvature of each spring leaf; a first cooler connected to a fluid source; exit guide rollers; an additional induction heating coil and cooler, both being arranged between said exit guide rollers and intended for surface hardening of spring leaves; an induction heating coil of said additional induction heating coil and cooler, being connected to a power source; a cooler of said additional induction heating coil and cooler, being connected to a fluid source; said first cooler, said additional induction heating coil and cooler and said exit guide rollers all being arranged along a circular arc having a radius equal to a specified radius of curvature of a spring leaf; a fluid source; and a means for actuating said live entry guide rollers.

4,294,099

ROLLING MILL TRAIN

Alfons Spaude, Dusseldorf, Fed. Rep. of Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,264

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844433

Int. Cl.³ B21B *1/12*

U.S. Cl. 72—234 **8 Claims**

1. A method of rolling, comprising the sequential steps of:

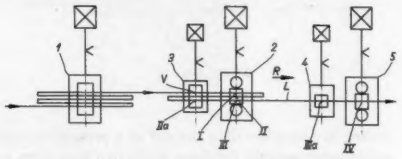
(a) passing material through a reversing pre-rolling stand;

(b) passing the material through an edging stand a first time;

(c) passing the material through a reversing universal rolling stand;

(d) passing the material back through the reversing universal rolling stand;

(e) passing the material through the edging stand a second



time with the reduction caliber roll of the edging stand adjusted from their position in step (b);

(f) passing the material back through the edging stand a third time with the reduction caliber roll of the edging stand adjusted from their position in step (e); and

(g) passing the material once again through the reversing universal rolling stand.

4,294,100

METHOD OF MANUFACTURING A SEAMLESS OUTER SLEEVE FOR A BALL BEARING

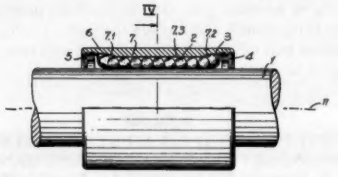
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt; Horst M. Ernst, Eltingshausen, and Toni Schulz, Dittelbrunn, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 11, 1979, Ser. No. 56,738

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831148

Int. Cl.³ B21D *53/10*

U.S. Cl. 72—340 **8 Claims**



1. In a method of manufacturing a seamless outer sleeve for a ball bearing from a hollow cylindrical tube of predetermined outer diameter and uniform wall thickness to have radially inwardly projecting race sections parallel to the tube's central axis for the load-carrying balls of the ball bearing with inclined race transition sections at each end of each load-bearing section, the method steps comprising (a) forming only said axial race sections by deformation to a depth d radially inward of said outer diameter, and (b) cutting away the outer circumference of the sleeve by the amount of the forming depth d of the race sections thereby forming at each end of each load-bearing section a ramp having thickness less than that of said load-bearing sections.

4,294,101

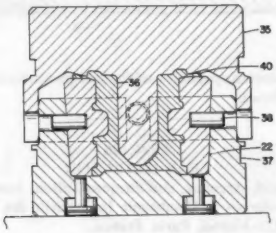
METHOD OF MAKING SINGLE OR DOUBLE FLANGED TRACK TRACTOR ROLLER FOR OFF-HIGHWAY EQUIPMENT

Donald J. Diemer, 4355 Brendan La., North Olmsted, Ohio 44070, and Ralph D. Delio, R.D. #1 Susan Trace, New Wilmington, Pa. 16142

Filed Jan. 12, 1979, Ser. No. 2,851

Int. Cl.³ B21D *22/00*; B21K *1/28*

U.S. Cl. 72—356 **29 Claims**



1. A method of closed die forging to form a flanged cylindrical metal part having at least two exterior cylindrical flanges and a cylindrical cavity, which comprises the steps of:

A. busting and preforming a heated billet to a cylindrical shape having one end and an axially opposite other end;

B. thereafter inserting the billet and a split ring outwardly thereof into a set of dies, said ring having an interior conformation with at least one interior cylindrical groove to form a first flange;

C. mating and supporting said ring within a first one of said dies to effectively close one end of said ring;

D. closing the other end of said ring with the other die to forge said billet; and

E. thereafter removing the split ring and billet together from said first-mentioned dies and placing the split ring and billet into a set of finishing dies, which finish forms the flanges and the cylindrical cavity, thereby displacing metal from the center of the billet into the flanges while forming the cylindrical cavity.

4,294,102

DEVICE FOR BENDING AND HARDENING BAR MATERIAL

Lothar Lückert, Hagen-Emst; Christoph Pohl, Witten; Carl-Erich Proll, Hagen, and Paul Steffes, Gevelsberg, all of Fed. Rep. of Germany, assignors to Proll & Lohmann Betriebs GmbH, Hagen, Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,611

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1979, 2912364

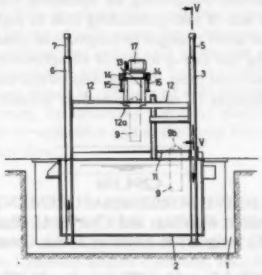
Int. Cl.³ B21D *37/04*

U.S. Cl. 72—413 **5 Claims**

1. In a device for the bending and/or distortion-free hardening of bar material, particularly leaf springs, having a plurality of frame-shaped tools each of which comprises an upper part and a lower part, the tools, upon closing, bending a heated workpiece and lowering the workpiece in clamped condition into a treatment tank, the tools being moved vertically in a portal for the bending and lowering and being discharged from the portal in a lowest position thereof and being transported by means of guide rails of a transport device through the treatment tank before the tools are grasped by a lift portal and raised into a position above the treatment tank, in which latter position the tools are opened, the workpiece is removed and the opened tools are transferred into a ready position, the improvement comprising

upper guide rail means for returning opened tools including a movable part of the length of said upper guide rail means, said movable part corresponds at least to the axial depth of a tool, said movable part defining a normal position relative to the remainder of said upper guide rail means, said movable part being movable out of said normal position,

changing means for being moved with said tool,



means comprising rail sections arranged on said changing means and for replacing said movable part of said upper guide rail means.

4,294,103

OVERLOAD SAFETY DEVICE IN HYDRAULIC FORMING PRESSES, IN PARTICULAR SHEET METAL FORM DRAWING PRESSES

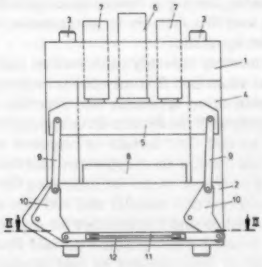
Willi Funck, Meerbusch; Roland Verheyen, Krefeld, and Heinz Schedler, Heidesheim, all of Fed. Rep. of Germany, assignors to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,495

Claims priority, application Fed. Rep. of Germany, May 11, 1979, 2919012

Int. Cl.³ B21J *9/20*

U.S. Cl. 72—453.14 **9 Claims**



1. A safety device against overload in a hydraulic forming press in particular for shaping sheet metal, said press comprising:

(A) A table beam with a press table attached thereto, an opposing beam spaced therefrom, and end supports spacing said beams each provided with tension members;

(B) A travelling beam guided at said opposing beam provided with at least one pressure cylinder to exert at said table a pressing force opposed by said tension members,

(C) at least one parallel linkage comprising

(a) a connecting rod pivoted at one end to one end of the travelling beam

(b) an angle lever pivoted at the end of an upper arm thereof to the other end of said connecting rod

(c) a like connecting rod pivoted at one end to the other end of the travelling beam

(d) a like angle lever, with its included angle facing the

same direction as the first, and similarly pivoted at the end of an upper arm thereof to the other end of the like connecting rod

(e) a transverse connecting rod pivoted at both ends one to each lower arm of said angle levers:

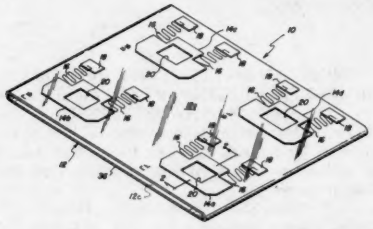
said safety device comprising an operating rod fixed to lie along at least one of said connecting rods in such a way as to move with the small changes in longitudinal dimension of said one connecting rod due to tensile or compressive strain arising from unsymmetrical press loading, and switch means operable by said movements of said one rod to actuate an overload indication.

4,294,104

FRICTION DRIVE FORCE MEASUREMENT FIXTURE

Robert M. Peffer, Penfield, and Charles H. Braun, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1979, Ser. No. 89,687
Int. Cl.³ G01N *19/02*
U.S. Cl. 73—9 **7 Claims**



1. Fixture for measuring the driving force of a friction drive apparatus, said fixture comprising:

a first member having a first surface including means for locating said first member in juxtaposition with said friction drive apparatus;

a reaction member movably supported on said first member such that when said first member is in juxtaposition with the friction drive apparatus said reaction member is in engagement with the friction drive apparatus and movable relative to said first surface in response to the driving force of the friction drive apparatus, said reaction member including reference means for indicating the relative position of said reaction member and said first surface; and

means mounted on said first member for urging said reaction member toward a rest position on said first surface, the magnitude of force applied by said urging means being porportional to the displacement of said reaction member from said rest position by the driving force, whereby the position of said reference means relative to said first surface indicates the magnitude of the driving force on said reaction member.

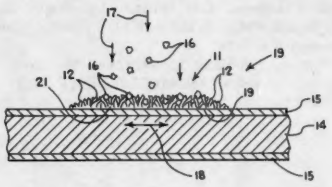
4,294,105

MASS SENSING ELEMENT

Arnold J. Kelly, Princeton Junction, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 8, 1980, Ser. No. 138,412
Int. Cl.³ G01N *22/00*
U.S. Cl. 73—28 **26 Claims**

1. An apparatus used for sensing the mass of incident particles impinging thereupon, comprising a piezoelectric crystal coated over at least a surface portion thereof with a plurality of substantially rigid whiskers having a generally perpendicular attitude with respect to said crystal surface and forming a mat-like mass upon said crystal so as to entrap or otherwise



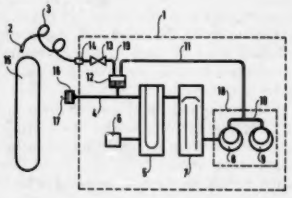
retain said incident particles while said piezoelectric crystal is caused to vibrate.

4,294,106

LEAK DETECTOR

Roland Gevaud, Argonay, and Jacques Tallon, Annecy, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Mar. 17, 1980, Ser. No. 131,121
Claims priority, application France, Mar. 28, 1979, 79 07788
Int. Cl.³ G01M *3/20*
U.S. Cl. 73—40.7 **5 Claims**



1. A leak detector of the type that detects helium, the detector comprising a sniffer connected via a flexible hose to an inlet duct which is itself connected via a nitrogen trap and a molecular diffusion pump to a main vacuum pump whose inlet is connected to the molecular diffusion pump and whose outlet exhausts into the atmosphere, the nitrogen trap being further connected to helium measuring means; the improvement comprising:

firstly providing the main vacuum pump in the form of a two stage pump having a low pressure stage connected to pump from the molecular diffusion pump and to exhaust, via a link duct, into a high pressure stage which itself exhausts to the atmosphere; and

secondly providing a bleeder arrangement connecting the flexible hose both to the inlet duct and to an auxiliary duct which leads to said link duct between the pump stages to pump air and any leaking helium along the flexible hose at a speed greater than that which is attainable when the hose is directly connected only to the inlet duct, the bleeder arrangement ensuring that a proportion of the gas pumped in through the sniffer is fed via the inlet duct and the nitrogen trap to the helium measuring means.

4,294,107

SELF-PURGING PROBE FOR LOW PRESSURE LEAK DETECTION

L. Irwin Walle, 1537 Greenlea Dr., Clearwater, Fla. 33515

Filed May 19, 1980, Ser. No. 150,933
Int. Cl.³ G01M *3/32*
U.S. Cl. 73—49.2 **7 Claims**

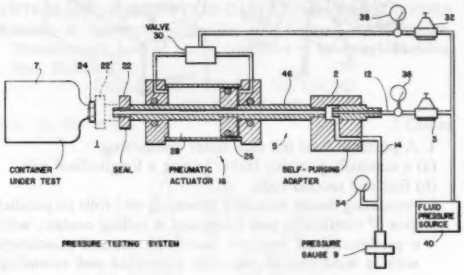
1. A fluid pressure purging adapter connected between a fluid test pressure source, a fluid pressure gauge and a fluid container undergoing a pressure test, for rapidly purging fluid

pressure from said pressure gauge when said container is disconnected from the adapter, comprising:

a fluid pressure inlet chamber connected to said fluid test pressure source;

a fluid pressure outlet chamber selectively connected to either said container under test or to an ambient fluid pressure;

a high velocity fluid chamber connected between said fluid pressure inlet chamber and said fluid pressure outlet chamber, for conducting the testing fluid from said inlet chamber to said outlet chamber at a minimum velocity when said container is connected to said outlet chamber and for conducting the testing fluid from said inlet chamber to said outlet chamber at a maximum velocity when said container is disconnected from said outlet chamber;



a pressure gauge channel connected to said fluid pressure gauge, having an orifice opening into said high velocity fluid chamber;

said high velocity fluid chamber having a fluid pressure substantially equal to the fluid pressure in said pressure gauge channel when said testing fluid therein has said minimum velocity and said high velocity fluid chamber having a fluid pressure substantially lower than the fluid pressure in said pressure gauge channel when said testing fluid therein has said maximum velocity;

whereby said fluid pressure is rapidly purged from said pressure gauge when said container is disconnected.

4,294,108

DEVICE FOR MEASURING THE FUEL CONSUMPTION OF A VEHICLE

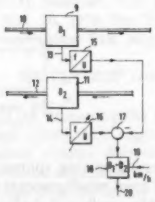
Wolfgang Sauerschell, and Karl-Heinz Werkmann, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Schwalbach, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 105,932

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905304

Int. Cl.³ G01F *9/02*

U.S. Cl. 73—119 A **3 Claims**



1. A device for measuring the fuel consumption of a vehicle, with means for measuring the fuel flow in a forward flow line, and means for measuring the fuel return flow in a return flow line, having means for detecting the difference between these flows and for the calculation of the fuel consumption, characterized in that, for the measurement of the fuel forward flow and of the fuel return flow, respectively, a turbine flowmeter is connected in each of the forward flow line and the return flow line and photoelectric means is positioned to scan the rotation of each for the generation of an electrical value corresponding to the forward flow or return flow, and that means for gauging are provided in one of said means for measuring the fuel flow in said forward flow line and in said means for measuring the fuel return flow in said return flow line to adjust the measurement in said one means to correspond with the measurement in said other means, for obtaining identical electrical values at operative fuel consumption and at the same forward fuel flow and return fuel flow.

4,294,109

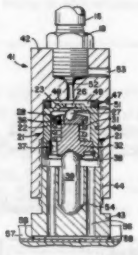
TEST APPARATUS FOR HYDRAULIC VALVE

Lester L. Peters, and John W. Black, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 19, 1979, Ser. No. 105,290

Int. Cl.³ G01M *15/00, 19/00*

U.S. Cl. 73—119 A **7 Claims**



1. Apparatus for use in testing a hydraulic assembly, the assembly including a cup-shaped part having a bottom wall, a generally cylindrical wall, and an orifice formed in the bottom wall thereof, a valve member within said cylindrical wall on one side of the orifice, a spring urging the valve member toward the bottom wall to close the orifice, and a spider positioned within the cylindrical wall and supporting the spring, the spider further being connected to the part, said apparatus comprising a housing having a bore formed therein that is adapted to receive the assembly, said housing including seal means adapted to engage the outer surface of said assembly and form a sealed chamber on the outer side of the bottom wall around the orifice, means on said housing for connecting said chamber to receive a fluid under pressure from a variable fluid pressure supply, and link means connected to said housing and adapted to engage the spider for supporting the assembly against said pressure in a manner that simulates actual operating conditions, said cup-shaped part being supported against said pressure only by said connection with said spider.

4,294,110

TORQUE MEASURING SYSTEM FOR AN AIR TOOL

Hugh L. Whitehouse, Lyndhurst, Ohio, assignor to The Stanley Works, New Britain, Conn.

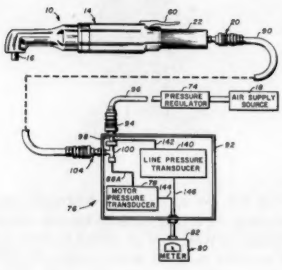
Filed Nov. 13, 1979, Ser. No. 93,111

Int. Cl.³ G01L *3/00*

U.S. Cl. 73—862.23 **4 Claims**

1. In an air tool for setting threaded fasteners to a desired torque and having a rotary air motor adapted to be energized to accelerate a rotary output of the motor to a predetermined free-running no-load speed and which decelerates in response to increased fastener resistance at a rate proportional to the rate of rise in motor air pressure caused by an increase in

torque applied by the rotary output of the tool in setting a fastener, a torque measuring system comprising a torque indicator located in external remote relation to the air tool, tubing having one end serving as a probe located within the air tool for sensing motor air pressure, an air supply hose connected to the air tool, the tubing extending through an air supply passageway in the air tool and into the air supply hose to the torque indicator for delivering a motor air pressure signal to the torque indicator for sensing and indicating torque applied to a fastener by the rotary output of the tool, the torque indicator including a junction box having a pressure transducer mounted therein and air signal tubing connected thereto, the junction box including conduit therein connected to a supply of compressed air, a first quick-disconnect coupling between the air supply hose and the air tool for supplying air under pressure to said air supply passageway, the first coupling including a socket attached to one of the hose and air tool members and a complementary plug attached to the other of said members, the socket and plug having complementary internal connectors coupled to the tubing in the hose and air tool members of their respective socket and plug components, the internal connectors of the socket and plug being engageable in registered relation with one another for communicating the



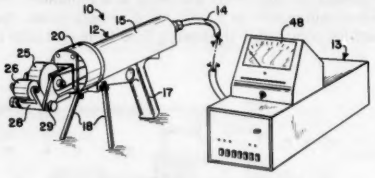
tubing in the air tool with the tubing in the air supply hose simultaneously upon connecting the socket and plug for establishing the supply air connection between the supply air hose and the air tool, the socket and plug and their internal connectors serving to simultaneously disconnect the supply air and the motor pressure signal air between the air supply hose and the air tool upon disconnecting said first coupling, and a second quick-disconnect coupling between the air supply hose and the junction box, the second coupling including a socket attached to one of the hose and box members and a complementary plug attached to the other of the said members, the socket and plug having complementary internal connectors coupled to the tubing in the hose and box members of their respective socket and plug components, the internal connectors of the socket and plug being engageable in registered relation with one another for communicating the tubing in the hose with the tubing in the junction box simultaneously upon connecting the socket and plug for establishing the supply air connection between the supply conduit of the junction box and the air hose, the socket and plug and their internal connectors serving to simultaneously disconnect the supply air and the motor pressure signal air to the pressure transducer upon disconnecting said second coupling between the air hose and junction box.

4,294,111

PORTABLE FLUID INK TACK TESTER

Wyman C. Rutledge; J. Robert Graves, both of Chillicothe, and William G. Cassill, McArthur, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Feb. 6, 1980, Ser. No. 119,052
Int. Cl.[3] G01N *19/04*
U.S. Cl. 73—150 R **4 Claims**



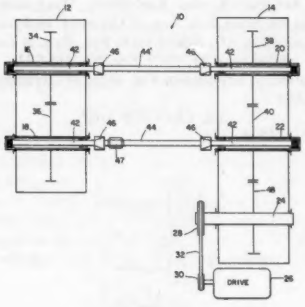
1. A portable fluid ink tack tester comprising:
(a) a manually portable frame having a longitudinal axis,
(b) first and second rolls,
(c) mounting means rotatably mounting said rolls on parallel axes of rotation on said frame and in rolling contact, with a predetermined pressure therebetween, and positioned with at least one of said rolls supported and extending outwardly from said frame to expose the surface thereof for contacting an ink coated surface and receiving an ink sample therefrom,
(d) rotating means including a drive shaft for controllably rotating said first roll at a predetermined speed,
(e) a rotating strain gauge mounted on said drive shaft for measuring the force supplied to said first roll by said rotating means, and
(f) means for displaying said measured force.

4,294,112

CLOSED TORQUE TEST MACHINE

Ronald D. Moore, Lexington Park, and John W. Hall, Lusby, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1980, Ser. No. 150,381
Int. Cl.[3] G01M *13/02*
U.S. Cl. 73—162 **14 Claims**



1. Apparatus for testing mating splined parts under rotational torque load and axial misalignments comprising:
a first pair of rotatably connected shafts;
a second pair of rotatably connected shafts;
means generally coextensive with and interconnecting the shaft pairs to define a four-square arrangement;
means for inducing a locked-in static torque in the arrangement;

at least one of the shafts carrying one splined part to be tested;

said interconnecting means carrying another splined part to be tested in mating torque load engagement with the first mentioned splined part;

means driving the arrangement and;

means for selectively positioning the splined part carried by the shaft out of concentricity with respect to the axis of shaft rotation;

whereby upon rotation of the arrangement the mating splined parts are torque tested under load and selected axial misalignment.

4,294,113

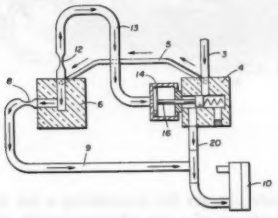
ANTI-SURGE SYSTEM FOR GASES AND OTHER MEDIA

Kenneth J. Sprott, Whitinsville, and George M. Herterick, Westborough, both of Mass., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 4, 1980, Ser. No. 118,263

Int. Cl.³ G01F *15/10*

U.S. Cl. 73—199 **7 Claims**



1. A device for preventing high pressure surges in fluidic material delivery systems to metering and measuring instruments comprising means for flowing the fluidic material to a normally closed pilot operated valve, means for diverting flow therefrom through a restrictor directly to said instruments, means for diverting flow therefrom through a restrictor to the pilot of the pilot valve to produce a time delay in total delivery of the fluidic material to the instruments.

5. A method for preventing high pressure surges in fluidic material delivery systems to metering and measuring instruments comprising flowing the fluidic material to a normally closed pilot operated valve, diverting flow therefrom through a restrictor directly to said instruments, further diverting flow therefrom through a restrictor to the pilot of the pilot valve to produce a time delay in total delivery of the fluidic material to the instruments.

4,294,114

APPARATUS FOR THE MEASUREMENT OF THE MASS OF A FLOWING MEDIUM

Heinz Lauterbach, Esslingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 20, 1979, Ser. No. 96,113

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1979, 2900210

Int. Cl.³ G01F *1/68*

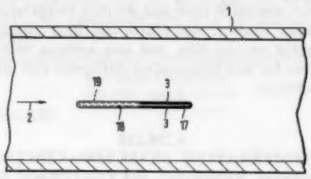
U.S. Cl. 73—204 **3 Claims**

1. In an apparatus for measuring the mass of an air induced mass into an internal combustion engine, having at least one temperature-dependent resistor disposed in the flow of the medium, the temperature-dependent resistor including: a carrier; and a resistor film disposed on the carrier and in the flow of the medium, the temperature and/or resistance of the resistor film being governed by the mass of the flowing medium, and serving as the basis for the generation of a manipulated variable which is a standard for the mass of the flowing medium, the improvement comprising:

a preceding body having approximately the same cross-section as that of the carrier,

said carrier extending longitudinally in the direction of the flow of the medium at least a portion of said resistor film disposed along said longitudinal direction, and

said preceding body being aligned with the carrier directly



upstream thereof in the direction of the flow of the medium, and having a length in the direction of the flow of the medium such that a particular boundary layer state prevails about the temperature-dependent resistor and the heat-transfer coefficient of the resistor film is influenced by the preceding body in accordance with the mass of the flowing medium.

4,294,115

MEASURING DEVICE FOR PRACTICALLY SIMULTANEOUS ΔT AND T MEASUREMENT

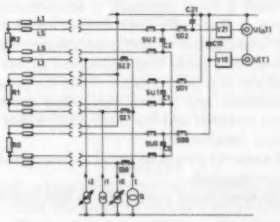
Herwig Labüs, Jülich, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Mar. 17, 1980, Ser. No. 130,849

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1979, 2910608

Int. Cl.³ G01K *7/16*

U.S. Cl. 73—342 **3 Claims**



1. A measuring device, for the practically simultaneous measurement of a temperature difference and an absolute temperature, comprising:

two temperature precision resistors for the two temperatures, and a reference resistor, one of said precision resistors being associated with said absolute temperature, and said resistors being connected in parallel;

a common constant power source;

current supply lines respectively connected with said resistors and said power source;

time switches respectively provided in said current supply lines and with the aid of which power can be successively applied to said resistors from said power source with equal current pulses during specified time intervals;

three capacitors respectively provided in parallel to said resistors;

sense lines and differential switches respectively connected with said resistors and capacitors, said capacitors being sequentially chargeable, with the aid of a time window switching during time intervals lying within said current

pulse time intervals, over said sense lines and said differential switches, to the pulse voltages which fall at said resistors; and

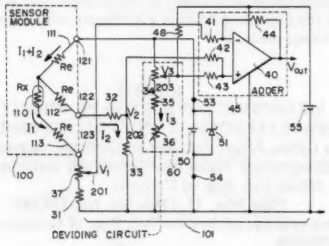
switches for the transfer, within a subsequent time interval, to a fourth capacitor, of the voltage difference between the other precision resistor and said precision resistor associated with said absolute temperature, and to a fifth capacitor, of the voltage difference between said precision resistor associated with said absolute temperature and said reference resistor, said fourth and fifth capacitors being grounded on one side, and said voltage values being a measure for said temperature difference and said absolute temperature.

4,294,116

TEMPERATURE DETECTING CIRCUIT

Keizo Yamamura, Nagaokakyo, and Yasuo Ohashi, Kyoto, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 14, 1980, Ser. No. 130,435
Int. Cl.³ G01K *7/20*
U.S. Cl. 73—362 AR **6 Claims**



1. A temperature detecting circuit comprising

a three-wire temperature sensor module including a first, a second and a third terminal, a temperature responsive resistance, a first cable lead connected across said first terminal and one end of said temperature responsive resistance, a second cable lead connected across said second terminal and said one terminal of the temperature responsive resistance, and a third cable lead connected across said third terminal and the other end of said temperature responsive resistance,

a first and a second power terminal across which a reference voltage is supplied,

said first terminal being connected to said first power terminal,

a first resistance connected across said third terminal and said second power terminal,

a second and a third resistance connected in series across said second terminal and said second power terminal,

the respective resistance values of said first, second and third resistances being such that a current flowing through said second cable lead is substantially equal to that of said third cable lead,

a potential devider being connected across said first and second power terminals and having a movable contact, and

a summing amplifying means for summing a first voltage appearing at a junction between said third terminal and said first resistance, a second voltage appearing at a junction between said second and third resistances and a third voltage appearing on said movable contact of the potential divider and for generating an output signal,

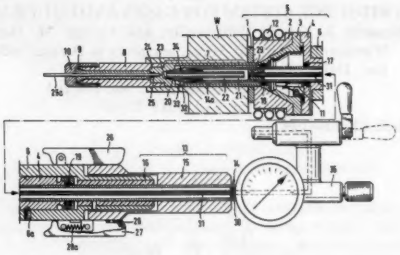
said potential devider being designed so that a variation of said third voltage can be rendered equal to a variation of said first voltage corresponding to the resistance value of said temperature responsive resistance sensing a temperature.

4,294,117

SAMPLE CHARGER FOR A GAS CHROMATOGRAPH

Hansueli Buser, Arlesheim, and Peter E. Jordi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 28, 1980, Ser. No. 116,139
Claims priority, application Switzerland, Feb. 8, 1979, 1243/79
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—864.85 **12 Claims**



1. A sample charger for introducing a test sample into a separating column of a gas chromatograph, comprising in combination:

a tubular charging chamber for receiving a tubular container for the test sample;

connection means at one end of said charging chamber for placing the interior thereof into communication with the separating column of a gas chromatograph;

at least one inlet adjacent said one end of said charging chamber for the admission of a carrier gas thereinto;

a lock disposed adjacent the end of said charging chamber remote from said connection means, said lock including a lock gate operable to open or close said chamber to atmosphere;

a sample holder for introducing the tubular sample container from outside through said open lock gate and into said charging chamber, said sample holder including an open-ended insertion tube for lengthwise insertion into said charging chamber;

receiving means disposed at said one end of said charging chamber for receiving the leading end of said insertion tube in sealing engagement therewith and for placing the interior of said insertion tube in communication with the separating column of the gas chromatograph through said connection means;

holding means disposed at said leading end of said insertion tube for releasably holding the forward end of said tubular sample container within said insertion tube, said leading end of said insertion tube being sealed by the sample container held therein;

a passage between the inner wall of said insertion tube and the outer wall of said sample container held in said insertion tube for flow of carrier gas into the open end of said sample container remote from said holding means;

at least one inlet adjacent said leading end of said sample holder for the admission of carrier gas from said charging chamber into said passage; and

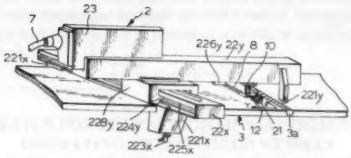
releasable means for holding said insertion tube in sealing engagement with said one end of said charging chamber.

4,294,118

FULLY AUTOMATIC ULTRASONIC FLAW DETECTION APPARATUS

Toshio Shiraiwa; Hisao Yamaguchi, and Shigeaki Matsumoto, all of Amagasaki, Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1979, Ser. No. 89,277
Int. Cl.[3] G01N *29/04*
U.S. Cl. 73—620 8 Claims



1. A fully automatic ultrasonic flaw detection apparatus comprising:

a probe for transmitting and receiving ultrasonic waves in a testpiece;

a probe holder having said probe mounted thereon;

a probe scanner connected to said probe holder having a first motor for moving said probe holder back and forth on a first line parallel to the surface of the testpiece and parallel to the area which is to be tested for flaws, and a second motor for moving said probe holder back and forth on a second line perpendicular to said first line and parallel to the surface of the testpiece;

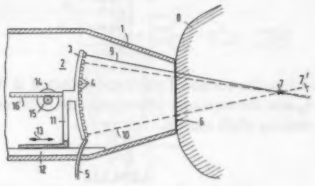
an information processing unit connected to said probe scanner and said ultrasonic transmitting and receiving apparatus having a memory means and a display means (a) for generating drive signals for application to said motors of said probe scanner for moving said probe holder according to a predetermined repeating rough scanning pattern in one direction along a first line, then along a second line for a short distance and then along another first line in the opposite direction, (b) for storing in said memory means flaw detection data indicative of the position of said probe when said probe receives ultrasonic waves from the testpiece and the amplitude of said received ultrasonic waves is indicative of a flaw, (c) for determining the position and characteristics of flaws in the testpiece from said stored flaw detection data, (d) for generating drive signals for application to said motors of said probe scanner for moving said probe holder according to a predetermined repeating fine scanning pattern in the vicinity of the position of each flaw if any flaw position is determined, said pattern being in one direction along a second line, then along a first line for a short distance and then along another second line in the opposite direction; and (e) for displaying the position and characteristics of each such determined flaw on said display means.

4,294,119

ULTRASONIC APPLICATOR FOR ULTRASONIC SCANNING OF BODIES

Richard E. Soldner, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 694,608, Jun. 10, 1976, Pat. No. 4,163,394.
This application May 17, 1979, Ser. No. 39,951
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529112
The portion of the term of this patent subsequent to Aug. 7, 1996, has been disclaimed.
Int. Cl.[3] A61B *10/00*
U.S. Cl. 73—625 12 Claims



7. Apparatus for scanning internal body regions accessible through narrow acoustic apertures, which comprises:

ultrasonic scanning means for sequentially directing converging ultrasonic beams along beam paths converging toward substantially a common point of convergence at a narrow acoustic aperture within the body such that the beams extend through the acoustic aperture and then diverge along successive scan lines forming a sector scanning configuration within an internal body region beyond the acoustic aperture, and

means for predominantly utilizing ultrasonic echo signals produced in the sector scanning configuration beyond the point of convergence so as to predominantly provide an ultrasonic echo sectional view of the internal body region beyond such acoustic aperture,

said ultrasonic scanning means comprising a housing having window means for transmitting the converging ultrasonic beams, each beam path within the housing having a length which is large in comparison to the distance of the point of convergence from the window means.

4,294,120

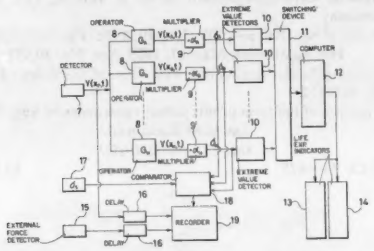
TORSIONAL VIBRATION MONITORING APPARATUS FOR ROTATING SHAFT SYSTEM

Ichiji Shima; Tatsuo Yamamoto; Shigeru Yoshibayashi; Hiroshi Teshima, all c/o The Kansai Electric Power Co., Inc., Technical Research Center of 2, Ichinotsubo 1-chome, Wakaoji, Amagasaki City, Osaka; Akio Hizume, 8-11, Naka-machi, 1-chome, Setagaya-ku, Tokyo; Tetsuo Iki, 1998-5, Yokoo-machi, Nagasaki City, Nagasaki Pref.; Takashi Yamamoto, 347, Motomurago, Tokitsu-cho, Nishisonogi-gun, Nagasaki Pref.; Kyozo Kanamori, 16-10, Shiraiwa-cho, Isahaya City, Nagasaki Pref., and Shigeho Tanaka, 39-27, Hokuyo-machi, Nagasaki City, Nagasaki Pref., all of Japan

Filed Jun. 8, 1979, Ser. No. 46,913
Claims priority, application Japan, Jun. 8, 1978, 53-69048
Int. Cl.[3] G01N *29/04;* G01H *1/10*
U.S. Cl. 73—650 3 Claims

1. A torsional vibration monitoring apparatus for a rotating shaft system in which the torsional vibration of the rotating shaft system is monitored by estimating torsional vibration at arbitrary positions x_j of the rotating shaft system from torsional vibration detected at a certain position x_p of the rotating shaft system on the basis of the facts that a torsional vibration $Y(x,t)$ produced in a rotating shaft system is an accumulation of modal vibrations $Y_i(x,t)$ and that each modal vibration is a product of a vibration mode type $g_i(x)$ and a vibration mode

component $h_j(t)$, comprising a detector for detecting the torsional vibration at the certain position x_p of the rotating shaft system and an operator having a transfer characteristic for



converting the torsional vibration detected at the certain position x_p into the torsional vibration at the arbitrary position x_j of the rotating shaft system.

4,294,121

POSITION MEASURING SYSTEM

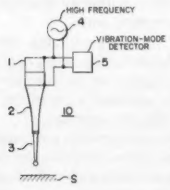
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed May 11, 1979, Ser. No. 38,174

Claims priority, application Japan, Jun. 6, 1978, 53-77591[U]; Aug. 5, 1978, 53-95976; Aug. 5, 1978, 53-108225[U]; Dec. 22, 1978, 53-162352

Int. Cl.³ G01M *7/00*

U.S. Cl. 73—662 **29 Claims**



28. A device for detecting a contact of a solid surface with a contact sensing probe on an elongated stylus assembly having a stylus in a position measuring system, said device comprising:

support means for carrying said stylus assembly to advance said probe towards said solid surface;

vibration means for imparting a small vibration to said stylus in the axial direction thereof to reciprocate repetitively said probe toward and away from said solid surface with an amplitude of 0.1 and 10 micrometers; and

response means responsive to a modification in the mode of vibration of said stylus upon said probe establishing a predetermined contact or proximity relationship with said solid surface for producing an output signal.

4,294,122

FASTENER INCORPORATING ULTRASONIC TRANSDUCER

James C. Couchman, Fort Worth, Tex., assignor to General Dynamics Corporation, Fort Worth, Tex.

Filed Jul. 12, 1979, Ser. No. 57,059

Int. Cl.³ F16B *31/02*; G01N *24/00*

U.S. Cl. 73—761 **29 Claims**

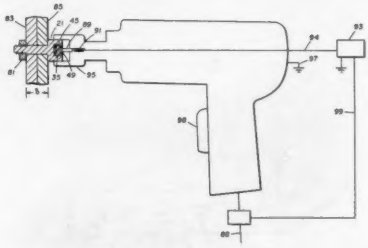
27. A fastener, comprising:

a shank having a head at one end and threads formed at the other end,

a shallow opening formed in one end only of said fastener, an acoustic transducer located in said opening and permanently secured therein with said transducer being acoustically coupled to said fastener,

said transducer being located in said opening such that it may be used for pulse-echo measurements wherein said transducer is pulsed, a transducer signal is generated which travels from said transducer through said fastener to the end of said fastener opposite said opening and back to said transducer at least once,

the distance between said transducer and said end of said



fastener opposite said opening being equal to a major portion of the length of said fastener such that when said signal is generated, it will travel through the entire gripping length of said fastener, including the portion of said shank next to said head, when traveling between said transducer and said end of said fastener opposite said opening,

said fastener being formed of metal with the portion of said fastener between said opening and said end of said fastener opposite said opening being of solid metal throughout.

4,294,123

TURBINE METER

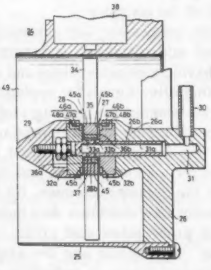
Hiroyuki Amemori, and Masao, Yamada, both of Kawasaki, Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Nov. 20, 1979, Ser. No. 96,186

Claims priority, application Japan, Nov. 22, 1978, 53-144885

Int. Cl.³ G01F *1/115*

U.S. Cl. 73—861.92 **5 Claims**



1. A turbine meter comprising: an axle member supported by a support member within a conduit through which a fluid to be measured is passed and having a small-diameter axle part and an annular recess formed around said small diameter axle part between a pair of opposed faces; a longitudinal flow passage formed in said axle member; a plurality of discharge holes formed in said axle member to communicatively connect the annular recess and the flow passage, said discharge holes comprising a first discharge hole formed in said small-diameter part, and a second discharge hole having one end thereof open into said passage and the other end thereof open into one of said opposed faces; a supply pipe inserted into said conduit

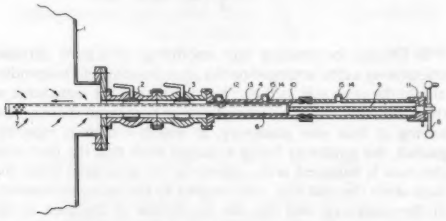
through the wall thereof, functioning to supply a pressurized fluid from a pressurized fluid source disposed outside of said conduit to said flow passage in said axle member; a vane wheel comprising, a hub disposed around said axle member and within said annular recess with minute gaps therebetween, being adapted to rotate in a substantially noncontacting state relative to said small-diameter axle part, a plurality of vanes implantedly fixed at their respective root parts to said hub, said vane wheel being rotated by a portion of said fluid to be measured and flowing through said conduit; and at least one discharge passage opening at one end thereof at one of said pair of opposed faces for communication with said annular recess and at the other end thereof, into said conduit through which said fluid to be measured is passed at a position separate from said vanes of said vane wheel, one end of at least one discharge passage opening in the inner periphery of said opposed faces, and the pressurized fluid which has been discharged from said discharge holes into said annular recess being discharged by way of said discharge passage to said conduit through which said fluid to be measured is passed at a position separated from said vanes.

4,294,124

APPARATUS FOR EXTRACTION OF MATERIALS FROM OPERATING PRESSURIZED VESSELS

George V. Kalwaitis, Gulf Breeze, Fla., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 10, 1980, Ser. No. 139,073
Int. Cl.³ G01N *1/10*
U.S. Cl. 73—863.85 **8 Claims**



1. A sampling apparatus for withdrawing and collecting samples from an operating pressure vessel without disturbing a reaction in said pressure vessel and while maintaining physical conditions of said sample, which apparatus comprises:
(a) a pressure vessel having an aperture;
(b) a first valve attached to said vessel and aligned with said aperture;
(c) a first tube having a sealed end and an open end;
(d) a second valve attached to said open end of said first tube and removably attached to said first valve;
(e) a second tube coaxially oriented within said first tube, said second tube having a perforated end for receiving a sample from said vessel; and
(f) means for sliding said perforated end of said second tube in and out of said second valve, said first valve, and said pressure vessel.

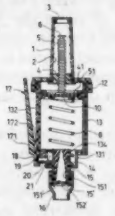
4,294,125

PIPETTE CONTROLLER WITH GRADUATE READING PLUNGER AND LEVER ASSEMBLY FOR GRAVITY DRAINAGE

Tsao-Piao Lee, No. 89-1, Chang Chun Rd. 2nd Floor, Taipei, Taiwan

Filed Apr. 24, 1980, Ser. No. 143,270
Int. Cl.³ B01L *3/02*
U.S. Cl. 73—864.15 **6 Claims**

1. A pipette controller comprising:
a cylinder;
a piston disposed in said cylinder;
a threaded rod operatively coupled to said piston;
a spring arranged in said cylinder between the bottom thereof and said piston for biasing said piston to a predetermined position;
a cylinder cap having a hole therein, said cap being coupled to said cylinder;
a graduate reading plunger in thread engagement with said threaded rod and disposed through said hold in said cylinder cap;
sealing means including a port for receiving the end of a pipette, the sealing means being disposed at the bottom of the cylinder for sealing the end of the pipette to the con-



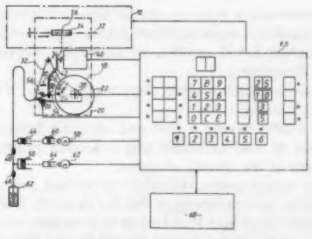
troller and placing the interior of the pipette in communication with a chamber defined by the piston and cylinder, said cylinder having a port for communicating with the atmosphere via a channel;
an operable lever assembly adapted to selectively close the port of said channel, said operable lever assembly including a lever arm including a pair of lugs and a seal pad for selectively sealing said channel, a member having a pair of claws for engaging the lugs of said lever arm and projection means for providing a fulcrum for said lever arm, said controller providing natural drainage when the end of the lever arm remote from said pair of lugs is biased toward said cylinder.

4,294,126

SAMPLE FEEDING DEVICE

Toma Tomoff; Wolfgang Chlosta, both of Überlingen; Heinz Henninger, Owingen; Rolf Tamm, Salem, and Klaus Grossmann, Owingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,704
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1979, 2900066
Int. Cl.³ G01N *35/04, 35/06*
U.S. Cl. 73—864.21 **9 Claims**



1. Sample feeding device for automatically feeding samples into a graphite tube atomizer provided with a sample inlet opening, comprising:
a turntable adapted to accommodate a circular array of liquid vessels, said turntable including a turntable position

sensor connected to said turntable, which sensor supplies a turntable position signal to a control device;

a turntable servomotor for driving said turntable, said turntable being arranged to be rotated by said turntable servomotor into positions determined by the program of said control device only and monitored by said turntable position signal;

a carrier, pivotably movable relative to an instrument base plate, is arranged to carry said turntable and said turntable servomotor, said carrier being arranged to be displaced by a separate carrier servomotor, said carrier having a carrier position sensor affixed thereto for applying a carrier position signal to said control device;

an intake tube movable between a first position and a second position by means of an intake tube servomotor, said intake tube, in its first position, dipping with one end into a respective liquid vessel located in an operative position, and, in its second position, extending with said one end into said sample inlet opening of said graphite tube atomizer;

a control device, adapted to control said intake tube servomotor, said turntable servomotor and said carrier servomotor in accordance with a certain program such that liquids from different liquid vessels are sucked into said intake tube and are discharged into said graphite tube atomizer and that in one position of said carrier said further liquid vessel is located below said intake tube when said intake tube is in its first position.

4,294,127

AUTOMATIC SAMPLE FEEDER FOR FLAMELESS ATOMIC ABSORPTION SPECTROMETER

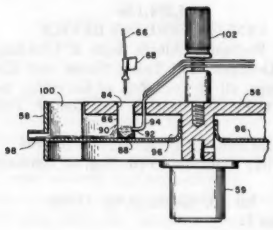
Toma Tomoff, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Fed. Rep. of Germany

Filed May 29, 1980, Ser. No. 154,208

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924124

Int. Cl.[3] **G01N** *35/06*

U.S. Cl. 73—864.21 **4 Claims**



1. In combination with an atomic absorption spectrometer having a heatable sample atomizer with an aperture for receiving an injected liquid sample, an automatic sample feeding apparatus comprising:

a rotatable turntable having therein a plurality of fluid containing vessels;

an intake tube having a first end movable between a first position at said turntable and a second position at the aperture of the sample atomizer;

pumping means connected with the second end of said intake tube, said pumping means for drawing in and injecting fluids from said first end of said intake tube; and

control means coupled to said turntable, said first end of said intake tube, and to said pumping means for respectively positioning a selected one of said vessels on said turntable under said first intake tube end, dipping said first end into said selected vessel, drawing a fluid sample therefrom, transferring said first end to said second position at said sample aperture, and injecting said fluid sample therein;

the improvement comprising:

said fluid containing vessels are overflow vessels having at least one fluid overflow aperture in the wall thereof;

an input conduit couples each of said overflow vessels with a source of fluid; and

an annular drain channel is positioned under said turntable, said drain channel forming a housing for said turntable and providing a waste fluid outlet for fluids from said overflow vessels.

4,294,128

DEVICE FOR ERECTING AND STABILIZING A GYRO VERTICAL

Peter Giesenberg, Uhldingen-Mühlhofen, Fed. Rep. of Germany, assignor to Bodenseewerk Gerätetechnik GmbH, Überlingen, Fed. Rep. of Germany

Filed Jan. 23, 1979, Ser. No. 6,079

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1978, 2838740

Int. Cl.[3] **G01C** *19/50*

U.S. Cl. 74—5.44 **16 Claims**

1. Device for erecting and stabilizing of a gyro vertical, comprising a disc arranged on the gyro housing and perpendicular to the gyro axis, said disc being driven in the same sense as the gyro rotor but at a reduced rate as compared thereto, and having at least one guideway, in which a mass is movably guided, the guideway being arranged such that the disc with the mass is balanced with respect to the gyro axis, when the mass abuts the rear end, with respect to the rotary movement, of the guideway, and that the movement of the mass in the guideway causes an erecting torque, when the gyro spin axis deviates from the vertical direction observed,

characterized in

that the guideway (**40,42;90,92;130,132**) is generally S-shaped and extends from one end (**82,84;106,108**) located near the edge of the disc (**14;88;128**) around the gyro spin axis (**16**) to an end (**60,62;110,112**) located near the gyro spin axis (**16**).

4,294,129

CONTROL LEVER OF ELECTRICAL STARTER

Alfred B. Mazzorana, Venissieux, France, assignor to Societe de Paris et du Rhone, Lyons, France

Filed Mar. 19, 1979, Ser. No. 24,212

Claims priority, application France, Jul. 29, 1977, 77 24135

Int. Cl.[3] **F02N** *11/00*

U.S. Cl. 74—7 A **4 Claims**

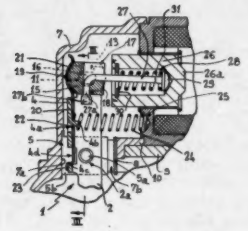
1. A control lever assembly for a starter for an internal combustion engine, the assembly being supported in a starter casing and the lever having one end cooperating with the core of a starter solenoid and having a second end actuating a starter gear, the assembly comprising:

(a) an elongated lever arm extending between said two ends and comprising two flat arm portions disposed normal to said pivot means and joined together by a web portion extending transversely therebetween;

(b) the casing having internal depressions disposed transversely of the lever intermediate its ends;

(c) pivot means located in and extending across said depressions and pivotally supporting the lever in the casing; and

said pivot means comprising two rivet members each having a head shaped to fit into a depression in the casing and each having a cylindrical body portion extending through a pivot hole in an arm portion;



(d) said one end of said lever having an arcuate member located thereat; and

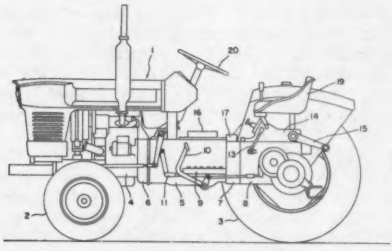
(e) rod means pivotally connected to the lever at said arcuate member and extending toward and coupled to said core to pivot the lever when the solenoid is actuated.

4,294,130

TRANSMISSION FOR TRACTOR

Hiroyuki Kisaka, Sennan; Makoto Sagata, Kaizuka; Masayoshi Miyahara, and Morimitsu Katayama, both of Sakai, all of Japan, assignors to Kubota Ltd., Japan

Filed Apr. 5, 1978, Ser. No. 893,757
Claims priority, application Japan, Apr. 27, 1977, 52-51031
Int. Cl.³ F16H *37/00*
U.S. Cl. 74—15.4 **9 Claims**



1. A transmission for a tractor, comprising:

a main shaft to receive engine power;

a travelling speed change shaft disposed in parallel with said main shaft;

a PTO speed change shaft disposed in parallel with said two shafts;

a first travelling speed change means of a hydraulic clutch type mounted on said travelling speed change shaft and having travelling speed change input gears;

a PTO speed change means of a mechanical clutch type mounted on said PTO speed change shaft and having plural PTO speed change gears;

a plurality of power transmission gears fixed on said main shaft for transmitting power to said travelling speed change input gears and said PTO speed change gears with at least one of said power transmission gears serving as a dual-purpose transmission gear to transmit power not only to one of said travelling speed change input gears but also to one of said PTO speed change gears;

a second travelling speed change means of a hydraulic clutch type connected to a rear end of said main shaft and having travelling speed change output gears, said second travelling speed change means being so constructed that, in response to power input from said main shaft, a clutch function thereof is performed prior to a speed change function thereof; and

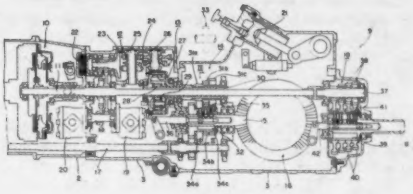
a plurality of travelling speed change gears fixed on said travelling speed change shaft and engaged with said travelling speed change output gears of said second travelling speed change means.

4,294,131

TRACTOR TRAVELLING SYSTEM TRANSMISSION MECHANISM

Yoshinobu Murayama, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed May 26, 1978, Ser. No. 909,790
Claims priority, application Japan, Nov. 10, 1977, 52-135811
Int. Cl.³ F16H *37/00, 37/06*
U.S. Cl. 74—15.4 **4 Claims**



1. A tractor transmission comprising

a transmission case (3) extending longitudinally of a tractor body,

a main shaft (11) extending longitudinally in the transmission case (3) and operatively connected to an engine (1),

friction type stepless transmission means (12) disposed above said main shaft (11) and in a front position within the transmission case (3) and interlocked with the main shaft (11),

a planet reduction gearing (13) mounted on the main shaft (11) and rearwardly of the friction type stepless transmission means (12) and including a first component element (28) interlocked with the main shaft (11), a second component element (27) interlocked with the stepless transmission means (12) and a third component element (29) in engagement with the first and second component component elements (28, 27), a forward/reverse changeover gearing (14) disposed beneath the main shaft (11) and rearwardly of the planet reduction gearing (13) and operatively connected to the third component element (29),

a differential gearing (16) disposed in a rear and lower position within the transmission case (3) and interlocked with the forward/reverse changeover gearing (14),

hydraulic means (21) disposed in a rear and upper position within the transmission case (3), and

a power-take-off shaft (8) disposed in a rear end position of the transmission case (3) and operatively connected to the main shaft (11), whereby a space is defined beneath said main shaft (11) and in a front position within said transmission case (3), said space housing a hydraulic pump (19) connected to said main shaft (11) for actuating said hydraulic means (21).

4,294,132

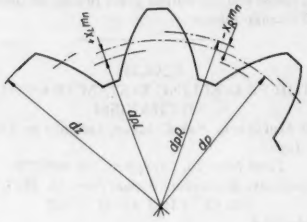
CYLINDRICAL GEAR WITH HELICAL TEETH

Zbigniew Matusz, Warsaw, Poland, assignor to Fabryka Obrabiarek Precyzyjnych "Ponar-Bruszkow", Pruszkow, Poland

Filed Sep. 25, 1978, Ser. No. 946,208
Claims priority, application Poland, Sep. 29, 1977, 201127
Int. Cl.³ F16H *55/08*
U.S. Cl. 74—462 **3 Claims**

1. A cylindrical gear wheel comprising helical teeth having

left and right hand sides with different pitch diameters (d_L and d_R), different angles of helix inclination (β_{OL} and β_{OR}), different nominal diameters (d_Z) and different profile face angles



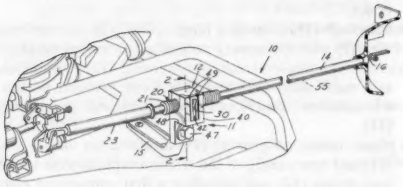
(xm_n) within at least a range of normal tooth module (m_n) varying from 2 up to 6 mm as the angular difference of inclination ($2\Delta\beta$) between the left hand (β_{OL}) and right hand (β_{OR}) sides varies within the range of 30′ and 3°.

4,294,133

BOWDEN CABLE RETAINER AND ADJUSTER

John J. Hurley, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 24, 1979, Ser. No. 78,130
Int. Cl.³ F16C *1/06*
U.S. Cl. 74—501 P **9 Claims**



1. A Bowden cable and an adjustable connector assembly for securing and positioning a Bowden cable with respect to a support member, said adjustable connector assembly including:

a grooved sleeve means attached to said Bowden cable, said grooved sleeve means being generally elongated along the axis of said Bowden cable and having circumferential grooves spaced along the Bowden cable axis;

a mounting assembly means for attaching said grooved sleeve means to the support member, said mounting assembly means including a clip means and an adjuster means for securing therebetween said grooved sleeve means;

said clip means and said adjuster means being adapted to mate laterally to said sleeve means and including a first connector means and a second connector means, respectively, for releasably attaching said clip means to said adjuster means sufficiently snugly so as to securely, longitudinally position said mounting assembly means with respect to said grooved fitting;

said first connector means having an inclined, ratchet like protrusion and said second connector means having a slotted, flexible finger for receiving said protrusion;

said clip means including ridges for mating with said grooves thereby providing a means to secure the longitudinal position of said mounting assembly means and said sleeve means;

said adjuster means including an opening for passing a securing member, such as a screw, for attaching said adjuster means to the support member; and

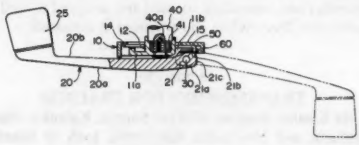
said first connector means including a concave arc portion with said ridges positioned thereon to mate with the grooved exterior surface of said sleeve means, and a first leg extending down from an end of said concave portion, an interior surface of said first leg including said ridges and an exterior surface of said first leg including said protrusion.

4,294,134

ACTUATING HANDLE MEANS

Keiji Mori, and Kyoichi Kurimoto, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 22, 1979, Ser. No. 51,233
Claims priority, application Japan, Jun. 23, 1978, 53/76074
Int. Cl.³ G05G *1/00*
U.S. Cl. 74—547 **7 Claims**



1. Foldable actuating handle means for vehicles which comprises base plate means adapted to be engaged with actuating shaft means to rotate therewith, actuating handle lever means provided with an actuating knob and having one end pivotably connected with said base plate means at a position remote from said actuating knob for movement between extended and folded positions, resilient spring means mounted on said base plate means and having one end constrained by said base plate means at a position diametrically opposite to the position where the actuating handle lever means is pivotally mounted on the base plate means, the resilient spring means having its other end adapted to resiliently bias the one end of the actuating handle lever means, said actuating handle lever means being formed at said one end with a pair of spaced seat surfaces which are adapted to be operatively engaged with said other end of the resilient spring means in the extended and folded positions, respectively, said spring means being deflected from its free position when its other end is operatively engaged with either of said spring seat surfaces, said actuating handle lever means being further formed with an intermediate projection between said spring seat surfaces so that the spring means is overridden when the actuating handle means is moved between the extended and folded positions.

4,294,135

TURBOMACHINE BALANCE CORRECTION SYSTEM

Robert P. Tameo, Peabody, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

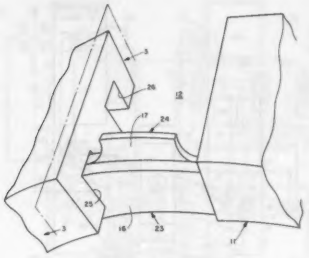
Filed Jan. 12, 1979, Ser. No. 4,248
Int. Cl.³ F16F *15/22*
U.S. Cl. 74—573 R **12 Claims**

1. A balancing system comprising in combination:

a rotor rotatable about an axis;

at least a pair of balancing rings mounted for rotation with said rotor, each of said balancing rings is provided with a radially extending tab; and

a plurality of axial retention locations positioned on said rotor in the form of axial slots parallel the axis, said tabs of



said balancing rings are oriented in selected axial retention locations for providing balance correction.

4,294,136

CRANK GEAR WITH ADJUSTABLE CRANK RADIUS FOR MOTOR DRIVEN WORKING IMPLEMENTS

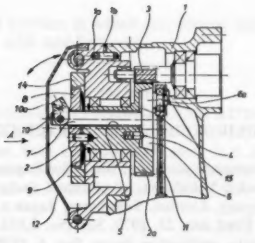
Martin Greppmair, München-Lerchenau, and Wittloff Grünwald, Pielenhofen, both of Fed. Rep. of Germany, assignors to Wacker Werke GmbH & Co. KG, Munich, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 485

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2758989

Int. Cl.³ F16C *3/04*

U.S. Cl. 74—600 **9 Claims**



1. A crank gear with adjustable crank radius for motor driven beating, working implements, especially tamping implements, jack hammers and hammer drills which includes: a housing, a crank shaft rotatably journalled in said housing, said crank shaft having a first end section and an axially oppositely located second end section, a crank disc connected to said first end section for rotation therewith and having an outer periphery provided with teeth, driving gear means meshing with said teeth and drivingly connectable to a prime mover for rotating said crank disc, a rotatable member associated with said crank disc and operable to move into a first position for engagement with said crank disc and also operable to move into a second position for disengagement from said crank disc, a crank pin mounted on said rotatable member for connection to a connecting rod, said rotatable member having an axis of rotation eccentrically arranged with regard to the axis of rotation of said crank disc, and control means associated with said second end section and operatively connected to said rotatable member for selectively moving the same into said first position or into said second position, said control means including spring means urging said rotatable member into said first position, that end face of said crank disc which faces away from said second end section being provided with a truncated cone-shaped recess the extension of which has the extension of its axis eccentrically located with regard to the longitudinal axis of said crank shaft, and said rotatable member being in the form of a truncated cone-shaped clamping disc conforming in shape to said truncated cone-shaped recess.

4,294,137

TRANSMISSION WITH VARIATOR

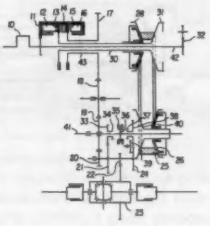
Jean Piret, Bougival, and Michel Jallas, Garches, both of France, assignors to Regie Nationale Des Usines Renault, Boulogne-Billancourt, France

Filed Mar. 16, 1979, Ser. No. 21,171

Claims priority, application France, Mar. 16, 1978, 78 07643

Int. Cl.³ F16H *37/06*

U.S. Cl. 74—665 G **7 Claims**



1. An automotive vehicle transmission having both variable transmission ratios and constant transmission ratios, said transmission being coupled to an automobile engine and comprising:

a variator providing a predetermined range of variable transmission ratios and including a primary shaft driven by said engine, a plurality of driving sheaves carried by said primary shaft, a plurality of driven sheaves, and a secondary shaft supporting said driven sheaves; and

a constant ratio direct drive located between said engine and said variator and providing a constant transmission ratio different from said predetermined range of variable transmission ratios;

wherein the engagement of said constant ratio direct drive releases said variator and the engagement of said variator releases said constant ratio direct drive,

whereby said transmission provides an increased range of ratios for a given size variator.

4,294,138

TWO STAGE TRANSMISSION HUB FOR A BICYCLE

Seiji Fukui, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Jul. 19, 1979, Ser. No. 58,735

Claims priority, application Japan, Jul. 21, 1978, 53-101296[U]; Jan. 30, 1979, 54-1125[U]

Int. Cl.³ F16H *3/44*; F16D *41/02*

U.S. Cl. 74—750 B **4 Claims**

1. A two stage transmission hub for a bicycle, comprising;

(a) a hub shaft;

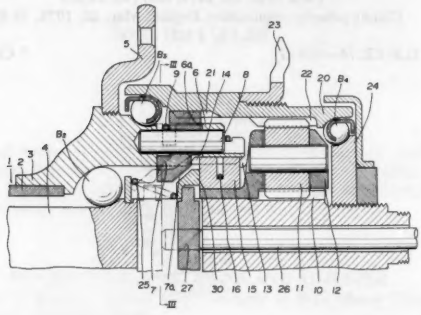
(b) a hub body rotatably supported to said hub shaft, said hub body being provided at both axial ends thereof with hub end portions having flanges respectively, one of said hub end portions having a cylindrical extension extending axially outwardly of one of said flanges, said cylindrical extension supporting at a substantially intermediate portion thereof freely rising and falling transmitting pawls;

(c) a sun gear provided at the outer periphery of said hub shaft at a position axially outwardly of said cylindrical extension;

(d) a gear frame having planetary pinions in mesh with said sun gear, said gear frame being supported rotatably to said hub shaft and being positioned axially outwardly of said cylindrical extension and arranged axially in series thereto;

(e) a unidirectional rotary transmission mechanism for transmitting one-directional rotation of said gear frame to said cylindrical extension;

(f) a cylindrical driving member covering the outer peripheries of said cylindrical extension and gear frame, said driving member being provided at the inner periphery of an axially inside portion thereof with ratchet teeth in mesh with said transmitting pawls, at the inner periphery of an axially outside portion thereof with inner teeth in mesh



with said planetary pinions, and at the outer periphery thereof with at least one sprocket;

(g) a pair of first and second bearing means for rotatably supporting said driving member, said first bearing means being provided on said cylindrical extension, said second bearing means being provided on said hub shaft; and

(h) a control member for controlling said transmitting pawls to cause their engagement with and disengagement from said ratchet teeth, said control member being supported to said hub shaft so as to be axially movable.

4,294,139

DRIVE FOR A MACHINE COMPRISING VARIABLE-STROKE RECIPROCATING PISTONS

Peter T. J. Bex, and George A. A. Asselman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 30, 1979, Ser. No. 99,182

Claims priority, application Netherlands, Jan. 5, 1979, 7900076

Int. Cl.³ F16H *35/08;* F01B *13/04*

U.S. Cl. 74—839 **6 Claims**

6. A drive for a machine having variable-stroke reciprocating pistons, comprising:

a shaft having an axis, said shaft being rotatably journalled in the machine;

a plate, mounted on the shaft so that the plate cannot rotate with respect to the shaft around the shaft axis, said plate being mounted on the shaft so that the angle between the plate and the shaft axis can be varied, by pivoting the plate around a plate axis, and so that the plate is movable along the direction of the shaft axis;

at least one piston comprising a piston rod having a piston rod head, said piston rod head having a side which faces the plate comprising a spherical surface; and

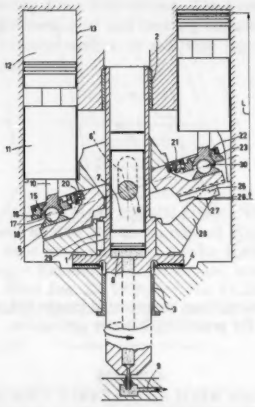
means for slideably coupling the splerical surface of the piston rod head to the plate;

CHARACTERIZED IN THAT

the plate has a side which is remote from the piston rod, said side comprising a cam having a cam surface;

the drive further comprises a structural member, rigidly coupled to the shaft, for supporting the cam via the cam surface;

said cam has a cross section which passes through said cam surface and which is substantially at least a portion of a circle having an axis which is parallel to the plate axis, the axis of said circle passing through the center of curvature



of said spherical surface of the piston rod head when the piston rod is situated opposite the cam.

4,294,140

HYDRAULIC TORQUE CONVERTER CONTROL SYSTEM

Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 23, 1979, Ser. No. 5,892

Claims priority, application Japan, Sep. 4, 1978, 53-107529

Int. Cl.³ B60K *41/10;* F16H *47/00;* F16D *33/00*

U.S. Cl. 74—868 **4 Claims**

1. A hydraulic control system for a vehicular automatic transmission including fluid operable units and a torque converter with a lock-up clutch, comprising:

a source of first pressurized fluid adapted to be used for operating the fluid operable units;

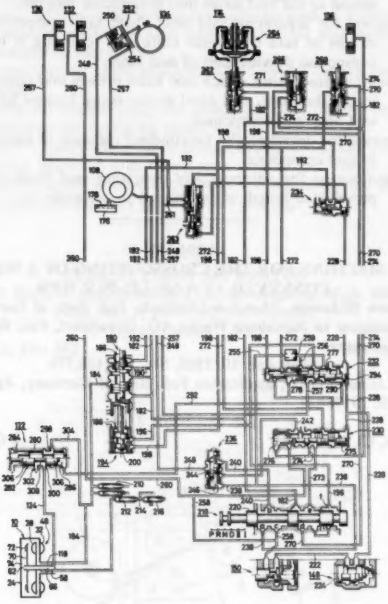
a source of second pressurized fluid that is indicative of the vehicle speed;

a lock-up control valve communicating with the torque converter and including a single control chamber and a valve member exclusively movable in response to pressure within said control chamber, said valve member being movable between a lock-up position in which the lock-up clutch is engaged and a release position in which the lock-up clutch is disengaged;

and

a shift valve communicating with said source of first pressurized fluid and with at least one of the fluid operable units, said shift valve including a chamber having a first port communicating with said source of second pressurized fluid, a second port communicating with said control chamber of said lock-up control valve and a port for drainage, said shift valve including a valve member mov-

able between a low speed position in which said second port communicates only with said port for drainage and a



high speed position in which said second port communicates only with said first port.

4,294,141

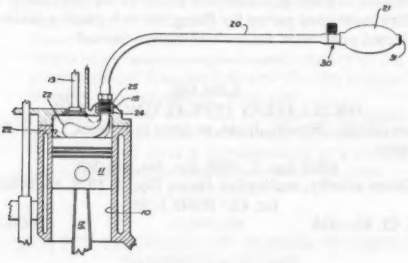
TOOL AND METHOD FOR HOLDING AUTOMOTIVE VALVES CLOSED DURING SERVICING

Ronald J. Miller, 4681 Lake Ave., Blasdell, N.Y. 14219

Filed Oct. 30, 1979, Ser. No. 89,406

Int. Cl.[3] B25B *11/00;* **B23P** *19/00*

U.S. Cl. 81—3 R **7 Claims**



1. An automotive tool for engagement with overhead valves to retain them in seated positions while working on the valve associated structure which is external of the automotive combustion chamber to prevent valves from falling into said chamber when released from such structure, said tool comprising an elongate tubular member having an inflatable balloon at one end thereof adapted to be projected through a spark plug opening into the combustion chamber, said balloon being of such form as to substantially fully occupy said chamber upon inflation thereof, means at the other end of said tubular member for supplying air pressure to said balloon through said tubular member and control valve means for selectively connecting said air pressure means to said balloon for inflating the latter to bear upwardly against the valves and for subsequently venting the tool to deflate the same and withdraw the balloon, and means for connecting the tool to the spark plug opening.

4,294,142

AUTOMATIC SCREWDRIVER

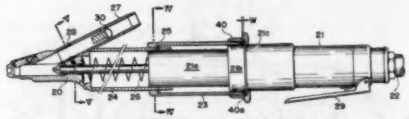
Syunji Sugahara, Osaka, and Takao Morimoto, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Jan. 10, 1980, Ser. No. 111,073

Claims priority, application Japan, Jan. 20, 1979, 54-5005

Int. Cl.[3] B25B *23/06*

U.S. Cl. 81—57.37 **3 Claims**



1. An automatic screwdriver having a power unit, comprising: a first cylindrical member having a bore extending therethrough, a hand grip portion, a guide portion and a contacting surface portion between said hand grip and guide portions, a hand-operated lever pivotally mounted on said hand grip portion; a screw driving bit adapted to be rotatably driven by said power unit under the control of said hand-operated lever; a second cylindrical member mounted to telescope over said guide portion; means for biasing said second cylindrical member away from said first cylindrical member; a feeder tube connected at one end to a front end of said second cylindrical member at an angle thereto for feeding a bolt or the like to the front end of said second cylindrical member; a third cylindrical member extending over said guide portion and movably mounted on said second member and having a contacting surface engageable with the contacting surface of said contacting surface portion; manually operable means for providing pressure contact between said contacting surfaces to couple said first and second cylindrical members together, said manually operable means being operable to decouple said contacting surfaces to allow said second cylindrical member to rotate manually to a desired angular position with respect to said first cylindrical member; and means for coupling said second and third cylindrical members to provide unitary rotation about their axes when said first and second cylindrical members are decoupled from one another and to allow said second cylindrical member to telescope with respect to said third cylindrical member.

4,294,143

METHOD AND APPARATUS FOR CUTTING INTO SEGMENTS A CONTINUOUSLY MOVING WEB OF RIGID INSULATION

Abraham Lieberman, 4555 Bonavista Ave., Apt. 31, Montreal, Quebec, Canada (H3W 2C7)

Filed Oct. 23, 1979, Ser. No. 87,499

Int. Cl.[3] B26D *1/18, 1/24, 1/56*

U.S. Cl. 83—37 **28 Claims**

8. Apparatus for transversely cutting into predetermined lengths, a continuous strip-like web, the web being conveyed along its longitudinal axis, the apparatus comprising:

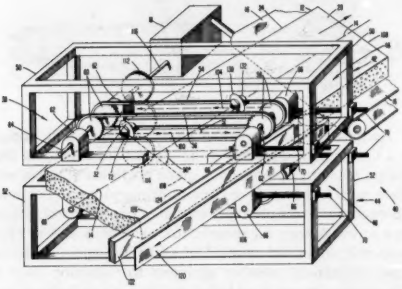
(a) means for simultaneously engaging and cutting into the moving web at both major web surfaces, said means including at least one pair of cooperating first and second blades;

(b) means for simultaneously tranporting said blade pair transversely across the web and longitudinally in the direction of conveyance of the web, said transporting means including

(1) first travelling carriage means positioned adjacent one major surface of the web and oriented to traverse the web along a first carriage path disposed at a first angle to the longitudinal axis of the web, said first travelling carriage means carrying said first blade;

(2) second travelling carriage means positioned adjacent the other major surface of the web and oriented to traverse the web along a second carriage path disposed at a second angle to the longitudinal axis of the web, said second travelling carriage means carrying said second blade;

(3) means for synchronizing the speed of said first travelling carriage means with the speed of said second travelling carriage means wherein said first blade cooperates with second blade to provide mutually opposing forces biasing the web against the cutting action of each



of said cooperating blades for completely severing the web through its thickness; and

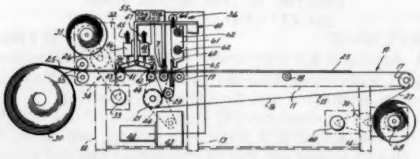
(c) means associated with said transporting means for aligning each blade of said blade pair such that the plane of the respective blade is perpendicular to the longitudinal axis of the web, wherein said transporting means includes first and second stationary frame means positioned adjacent the opposite major web surfaces, and wherein said first and second travelling carriage means include, respectively, first and second endless belt means supported in said respective frame means to span the web along respective ones of said first and second carriage paths, and wherein said aligning means includes a plurality of assemblies for holding the individual blades of said blade pair, said blade-holder assemblies being attached to the respective ones of said first and second endless belt means.

4,294,144

APPARATUS FOR CUTTING SHEET MOLDING COMPOUND

Richard H. Hayes, Tallmadge, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Nov. 7, 1979, Ser. No. 91,968
Int. Cl.³ B26D *5/02, 9/00*
U.S. Cl. 83—71 **4 Claims**



1. Apparatus for cutting sheet molding compound carried on a liner comprising,

a conveyor for carrying compound and liner,

a plurality of transversely adjustable slitting knives engageable with said compound to form longitudinal slits in said compound to form strips of selectively variable width,

a transversely movable knife engageable with said compound to cut said strips into preselected lengths,

means for separating said liner from said compound upstream of said transverse knife and returning it to said compound downstream of said knife,

anvil means against which said knife presses said compound to cut the same, said anvil means being located between said liner and compound,

means for detecting the longitudinal distance of movement of said compound,

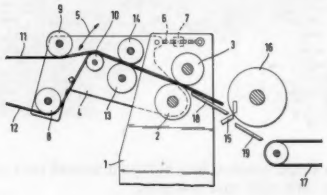
and means for automatically operating said knife after a preselected length of compound passes under it.

4,294,145

MACHINE FOR THE CROSSCUTTING OF A WEB CONVEYED AS A MULTI-PLY WEB

Jakob Bödewein, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 10, 1980, Ser. No. 138,775
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1979, 2917582
Int. Cl.³ B26D *1/62*
U.S. Cl. 83—302 **5 Claims**



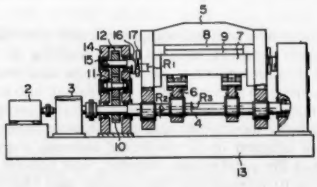
1. A machine for the crosscutting of a multi-ply web, comprising: a crosscutter; means preceding the crosscutter in the direction of web travel for guiding the plies of the web; means disposed between the web guiding means and the crosscutter for feeding the multi-ply web to the crosscutter comprising a pair of rolls; and means for compensating for the differences in sheet lengths of the various plies cut by the crosscutter comprising means mounting the web guiding means for pivotable movement as a unit about the axis of one of the two rolls of the feeding means and means for fixing the web guiding means in a selected position in the path of motion thereof.

4,294,146

OSCILLATION TYPE FLYING SHEAR

Yukio Ohtake, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 1, 1980, Ser. No. 136,248
Claims priority, application Japan, Dec. 3, 1979, 54-155670
Int. Cl.³ B26D *1/56*
U.S. Cl. 83—316 **5 Claims**



1. An oscillation type flying shear comprising:

a main crank shaft driven by drive means;

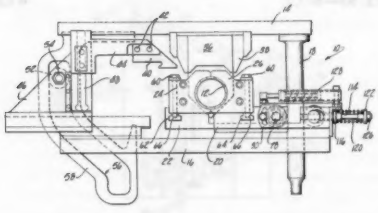
a frame pivotally supported by a first eccentric portion of said main crank shaft;
an upper cutting blade secured to said frame;
a lower cutting blade holder pivotally secured to a second eccentric portion of said main crank shaft and slidably attached to said frame;
a lower cutting blade secured to said lower cutting blade holder;
gearing for transmitting the rotational force of said drive means to an oscillating crank; and
a link for transmitting the eccentric movement of said oscillating crank to said frame as a pivotal movement; the improvement comprising means for adjusting the gear meshing position of gears of said gearing.

4,294,147

TUBE CUTTING APPARATUS

John J. Borzym, 4820 Schoolbell La., Birmingham, Mich. 48010

Filed Feb. 7, 1980, Ser. No. 119,241
Int. Cl.³ B23D *21/00*
U.S. Cl. 83—382 **24 Claims**



1. Apparatus for clamping a workpiece, comprising:
a pair of opposed, complemental die jaws;
first and second slide means respectively mounting said die jaws for sliding movement toward and away from each other between an open release position and a closed clamping position;
first and second cam followers; and
means for respectively mounting said first and second cam followers on said first and second slide means, including means for allowing selective adjustment of the distance between said die jaws,
said adjustment means including
(1) selectively rotatable eccentric shaft means on said first slide means for rotatably mounting said first cam follower on said first slide means, said eccentric shaft means being operative upon rotation thereof to shift the position of said first cam follower whereby to adjust the distance between said die jaws, and
(2) means coupled with said eccentric shaft means for locking said eccentric shaft means in a selected rotational position thereof corresponding to a desired adjustment of said distance between said die jaws.

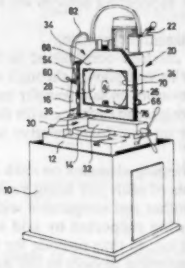
4,294,148

GUARDS FOR CIRCULAR SAW BLADES OF CIRCULAR SAWING MACHINES

Karl Drixler, Nürtingen-Neckarhausen, Fed. Rep. of Germany, assignor to Chr. Eisele Maschinenfabrik GmbH. & Co. KG, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 102,122
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 7837368[U]
Int. Cl.³ B27B *5/29*
U.S. Cl. 83—397 **9 Claims**

1. A guard for the circular saw blade of a circular sawing machine whose sawing unit has a horizontally supported saw spindle and is disposed on a frame of the machine so as to be vertically movable, the guard being arranged to cover the circular saw blade from above and at least partially on an accessible end face thereof and on the circumferential portion of an operating side, the guard forming a housing arranged to be mounted on the machine frame so as to be fixed relative to the circular saw blade with the latter in an upper starting position, said housing being open at its bottom only and, with said saw blade in its upper starting position, said housing completely accommodating the circular saw blade, a downwardly extended elongate opening being disposed in a side wall of the housing to accommodate the saw spindle and being associated with a covering element arranged to move between a covering



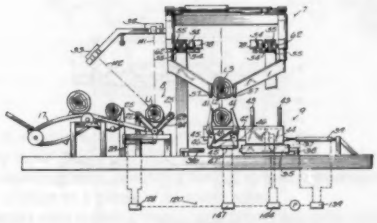
position, in which the covering element covers at least one region having disposed therein the circumference of the circular saw blade and being associated with the part of the elongate opening disposed beneath the saw spindle when the circular saw blade is in the upper starting position, and a released position, the covering element operating toward said released position and progressively exposing the said part of the elongate opening when feed motion of the circular saw blade is performed, the saw spindle traveling within the elongate opening during such feed motion.

4,294,149

APPARATUS FOR MEASURING AND ORIENTING LOGS FOR SAWING

Lars J. Olsson, Linkoping, Sweden, assignor to Saab-Scania AB, Jonkoping, Sweden

Continuation-in-part of Ser. No. 856,130, Dec. 1, 1977, abandoned. This application Aug. 23, 1979, Ser. No. 68,904
Int. Cl.³ B27B *15/04, 29/04, 1/00*; B56G *47/90*
U.S. Cl. 83—435.1 **12 Claims**



1. Apparatus comprising a feed mechanism by which a log is fed to a cutting machine in horizontal substantially lengthwise translatory motion parallel to a vertical cutting plane through the cutting machine, said feed mechanism comprising carriage means constrained to move horizontally in opposite directions parallel to the cutting plane and two pairs of jaws on the carriage means, projecting downwardly to a level beneath the carriage means, for gripping opposite sides of a log to constrain the log to move with the carriage means, said apparatus being characterized by:

A. measuring station means defining a reference plane that is

spaced a distance to one side of said cutting plane, said measuring station means comprising

(1) a pair of supporting devices that are movable to and from an operative position in which the supporting devices can cooperate to cradle a log near opposite ends thereof and substantially confine the log to rotation, with the log at a measuring level below said level of the jaws of the feed mechanism and its length substantially horizontal, and with the log approximately in lengthwise symmetry to said reference plane, and

(2) means for moving said supporting devices between their said operative position and an inoperative position in which the supporting devices are below said measuring level;

B. transfer mechanism comprising

(1) a transfer carriage constrained to horizontal motion transversely to said planes, through said distance,

(2) a pair of elevators on said transfer carriage constrained to move through said distance with the transfer carriage but movable up and down relative to the transfer carriage, and

(3) a pair of gripping elements on each elevator, the gripping elements of each pair being swingable toward and from one another and cooperable with their elevator to pass under a log supported by said supporting devices and grip the log, to thus provide for transfer of the log from the supporting devices to the transfer mechanism, with the log in a rotational orientation established for it at the measuring station and in a lateral orientation established for it by the gripping elements;

C. actuating means on the carriage means of the feed mechanism, reacting between the two jaws of each pair thereof, for converging the jaws in any positions transversely of the cutting plane in which the jaws establish themselves when they converge upon a log to grip it; and

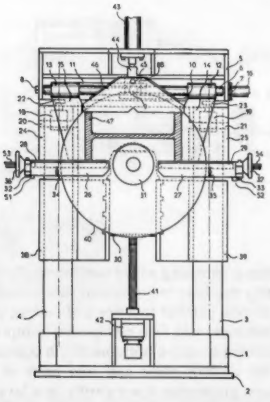
D. means on the carriage means for adjustably shifting each of said pairs of jaws laterally to enable a log supported by the feed mechanism to be established in a desired lateral position and orientation relative to the cutting plane.

4,294,150

SAWING OR CUTTING MACHINE

Jean Vierstraete, 83, rue Victor Hugo a, Oignies (Pas-de-Calais), France

Filed Jun. 27, 1979, Ser. No. 52,494
Claims priority, application France, Jun. 27, 1978, 78 19834
Int. Cl.[3] B23D *47/04, 47/08*
U.S. Cl. 83—453 **8 Claims**



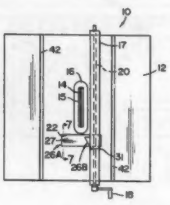
1. A sawing machine capable of straight or bias cutting comprising a frame having a pair of vertically extending members spaced from one another, a motor having a horizontal shaft and a rotary saw having a saw blade mounted on said shaft, means for mounting said motor on said frame and for moving it vertically of said frame, means for supporting a workpiece comprising two generally horizontal cross-bars extending toward one another from said vertical members of said frame, inner ends of said cross-bars being spaced from one another to leave room for said motor and saw, each of said cross-bars comprising two parallel members which are spaced apart to receive said saw blade between them, means for centering said workpiece on said supporting means and means engaging said workpiece from above for holding it down on said supporting means, said motor and saw being movable upwardly to cut a workpiece supported by said supporting means, centered by said centering means and held down by said hold-down means.

4,294,151

ANTI-KICK BACK DEVICE

Julian Lemus, 5614 River Shore Dr., Tampa, Fla. 33603

Filed Nov. 23, 1979, Ser. No. 96,926
Int. Cl.[3] B27B *5/22*
U.S. Cl. 83—477.2 **4 Claims**



1. In a bench power saw having a work table with a rotary cutting blade projecting above the plane of the table, and a guide fence extending vertically from the table and being adjustably positionable on the table parallel to said blade for establishing the width of a cut, the table and fence establishing a workpiece path, the provision of a means for preventing the unintentional reverse drive of a workpiece as the cut is completed, comprising:

a surface of the guide fence having a recess opening prior to the blade position and adjacent thereto;

a blocking member housed in said opening;

said blocking member located in said workpiece path and having a cam surface on the side thereof opposite the blade;

means for mounting said blocking member for movement about a substantially vertical axis between a fully retracted position within said opening and a projected position wherein said cam surface extends from said opening in an outwardly angular direction towards said blade; and

means for urging said blocking means to the projected position, whereby a workpiece directed toward the blade in the workpiece path will cam down the blocking member and proceed to the cutting position, and after the workpiece has passed over the blocking member, but before being fully severed, the blocking member will return to the projected position to prevent reverse travel of the workpiece.

4,294,152

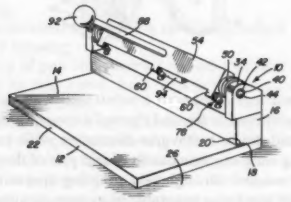
FILM PUNCH

Donald E. Land, 10000-½ E. 56th St., Raytown, Mo. 64133

Filed May 16, 1979, Ser. No. 39,668
Int. Cl.[3] B26D *5/08, 5/18*
U.S. Cl. 83—588 **2 Claims**

1. A sheet punching apparatus including a sheet supporting base defining a sheet supporting surface, an elongated support member mounted on said base and including a longitudinal central portion and opposite end portions, said support member projecting outwardly from said surface and including spacer means for spacing said support member from said base

to define an open elongated sheet marginal edge receiving slot between said support member and said base extending along said support member and opening, laterally, across said surface, a pair of aligned support blocks removably supported from said opposite end portions of said support member outwardly from said surface and spaced along said slot, elongated shaft means including an elongated central head portion and opposite end portions extending between and removably journaled from said support blocks, a pair of coiled torsion springs disposed about said opposite end portions of said shaft means and operatively connected between said shaft means and said support blocks, said support member defining a plurality of sleeve bores formed therein and spaced therealong and disposed generally normal to said surface and opening into said slot, a plurality of bearing sleeves removably received in said bores above said slot, a plurality of generally parallel elongated punch members reciprocal in said sleeves and including first and second ends, said base defining a plurality of die bores formed therein aligned with said sleeve bores, a plurality of die sleeves disposed in said die bores, said central elongated head portion including crank arm portions spaced therealong regis-



tered with said sleeve bores, a plurality of elongated generally parallel connecting link structures pivotally connected at one set of corresponding ends thereof to said crank arm portions, and at the other set of corresponding ends to the first ends of said punch members, said longitudinal central portion of said support member including an abutment block supported therefrom, said head portion and abutment block including coacting abuttingly engageable portions defining first and second limit positions of oscillation of said head portion and shaft means relative to said base, said punch members, connecting link structures and crank arms being substantially aligned in one limit position of oscillation of said head portion with the second ends of said punch members disposed within said die sleeves, said head and crank arm portions being angularly displaced generally 35° from said first limit position when said head portion is disposed in the second limit position with said second ends of said punch members retracted across said slot and into said bearing sleeves, said springs yieldingly biasing said head portion to said second limit position, said head portion including a laterally outwardly projecting operating arm disposed at generally 90° relative to said crank arm portions.

4,294,153

METHOD OF SYNTHESIZING MUSICAL TONES

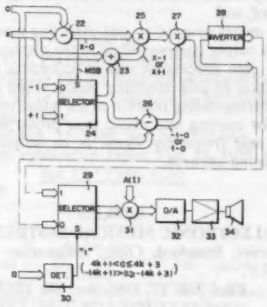
Yasuhiro Mitsuhashi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 20, 1979, Ser. No. 77,341
Claims priority, application Japan, Sep. 26, 1978, 53/118398
Int. Cl.³ G10H *1/043*
U.S. Cl. 84—1.01 **7 Claims**

1. A method of synthesizing a musical tone comprising the steps of:

periodically producing a fundamental signal which can be represented as a waveform crossing an axis representing zero amplitude, the fundamental signal having first, second and third zero crossing points (i.e., the points at which said waveform crosses said zero amplitude axis) at a phase within one cycle period of the fundamental signal, said first and third zero crossing points being a starting point and a terminating point of the waveform in one cycle period respectively, said second zero crossing point being an intermediate transitional point of the waveform in one cycle period from one side to the other of the zero amplitude axis;

periodically producing a modulation signal; and



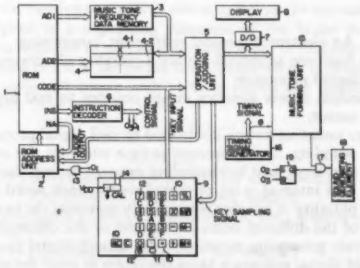
modulating the phase of said second zero crossing point of said fundamental signal with said modulation signal without modulating the phases of said first and third points to thereby determine the frequency spectrum of the resulting signal to produce a synthesized musical tone.

4,294,154

MUSIC TONE GENERATING SYSTEM

Hidetaka Fujisawa, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1979, Ser. No. 104,911
Claims priority, application Japan, Dec. 27, 1978, 53-161881
Int. Cl.³ G10H *1/00,-5/00*
U.S. Cl. 84—1.01 **7 Claims**



1. A music tone generating system comprising:

key input means including entry keys and function keys for inputting data, said keys having at least a corresponding relation to a plurality of music tones;

display data memory means for storing data to be displayed;

key input data processing means connected between said key input means and said display data memory means for executing a key input processing operation in accordance with a key operation by said key input means and for delivering data to be displayed as an output to the display data memory means;

display means coupled to said display data memory means and having a plurality of display digits for displaying the data to be displayed which is stored in said display data memory means;

a sound producing element for producing a sound corresponding to a music tone;

music tone signal producing means for delivering a frequency signal corresponding to each of a plurality of music tones to said sound producing element in accordance with the operation of the keys of said key input means which have a corresponding relation to music tones;

detecting means for detecting that at said display means the display data is displayed over all the display digit positions thereof; and

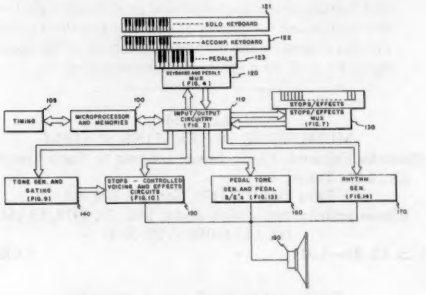
control means coupled to said detecting means for suppressing an output corresponding to the display data at said key input data processing means according to the result of detection of said detecting means when the keys having the corresponding relation to the music tones are operated and for causing said music tone producing means to deliver said frequency signal as an output to said sound producing element.

4,294,155

ELECTRONIC MUSICAL INSTRUMENT

James Turner, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Filed Jan. 17, 1980, Ser. No. 112,895
Int. Cl.[3] G10H *1/24, 1/36, 5/00*
U.S. Cl. 84—1.01 **76 Claims**



1. An electronic musical instrument, comprising:

at least one keyboard having a plurality of octaves of keys;

a digital processor;

random access memory means coupled to said digital processor;

key sampling means, controlled by said digital processor, for sampling, during successive time intervals, the statuses of said keys, said key sampling means forming, during each time interval, a set of digital words, each word having a plurality of bits that respectively represent the key statuses of the different octaves of a note of the chromatic scale;

music generating means coupled to said digital processor;

said digital processor being operative to store the statuses of said keys in said random access memory means and to read out key-representative signals from said random access memory means to said music generating means.

4,294,156

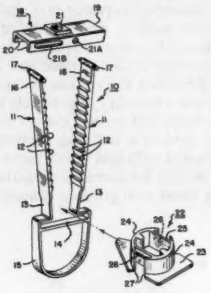
HIGH STRENGTH ANCHOR ASSEMBLY FOR FASTENER

Thomas W. McSherry, Floral Park, and Nathaniel H. Garfield, Harrison, both of N.Y., assignors to Mechanical Plastics Corporation, Pleasantville, N.Y.

Filed Oct. 6, 1978, Ser. No. 949,006
Int. Cl.[3] F16B *21/00, 13/06*
U.S. Cl. 411—345 **6 Claims**

1. In an anchor assembly for retaining an elongated fastener member within an opening defined by a wall portion having at least one concealed side, of the type comprising (1) at least two elongated leg members each having a long dimension and a major transverse dimension, (2) means for connecting a pair of adjacent end portions of said leg members, (3) an apertured anchor member coupled to said legs at the opposite end portions thereof, and (4) a collar member secured to said legs for sandwiching said wall portion between said collar and said anchor member, the improvement wherein:

said anchor member comprises a channel member having a pair of flanges each defining a pair of coupling apertures; and



each of said legs comprises a substantially straight portion having disposed at the end thereof a coupling stud aligned along said major transverse dimension with each of said coupling studs engaging each of said pair of flanges of said anchor member through said coupling apertures,

each of said legs being pivotable in a common plane about an axis of rotation which is coincident with the longitudinal axis of the coupling stud.

4,294,157

PROJECTILE DEPLOYED CABLE WEAPONS SYSTEM

Charles M. Stancil, Springfield, Va., assignor to Stahan Corporation, Springfield, Va.

Filed May 1, 1979, Ser. No. 34,989
Int. Cl.[3] F41F *1/00*
U.S. Cl. 89—1 G **15 Claims**

1. An assemblage for deploying an amount of cable to defeat a helicopter rotor system, the assemblage comprising:

(a) a first wall member defining a first cavity for receiving a projectile,

(b) a projectile situated with respect to the first cavity so as to be at least temporarily received therein,

(c) a second wall member joined to the first member and defining at least a second cavity for receiving an amount of cable,

(d) an amount of cable situated within the second cavity, and

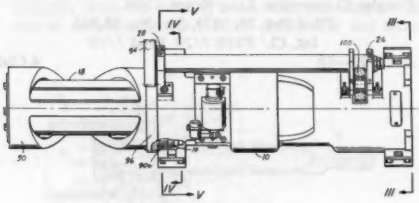
(e) an inelastically deformable patch attached to the cable and situated over an opening in the first wall member so as to intercept said projectile and conformably engage the leading tip of said projectile when deployed.

4,294,158

GUN BOLT CONTROL MECHANISM

Raymond A. Patenaude, Burlington; Thomas W. Cozzy, South Burlington, and Stephen J. Bullis, Colchester, all of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Jan. 8, 1979, Ser. No. 2,037
Int. Cl.³ F41D 7/04
U.S. Cl. 89—12 **5 Claims**



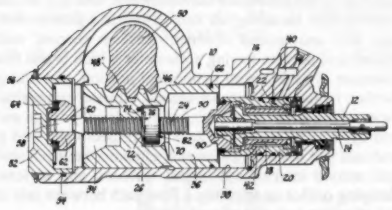
1. An automatic gun including:
a housing;
a rotor journaled for rotation on a longitudinal axis relative to said housing;
a plurality of gun bolts carried by and journaled for reciprocation in said rotor, each gun bolt having a respective cycle of operation;
a first cam means coupled to and driving in reciprocation each of said gun bolts during a first portion of the respective cycle of operation of each of said gun bolts; and
a second cam means coupled to and driving in reciprocation each of said gun bolts during a second portion of said respective cycle of operation of each of said gun bolts.

4,294,159

THREAD DELASHER IN VEHICLE STEERING GEAR

Paul O. Wendler, Saginaw, and Clarence E. Welsh, Merrill, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1979, Ser. No. 77,855
Int. Cl.³ F15B 9/10
U.S. Cl. 91—375 A **3 Claims**



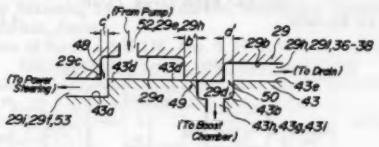
1. A power steering gear comprising a housing, an input member mounted for turning movement in said housing and extending from one end thereof, an output member operatively mounted for turning movement in said housing and extending outwardly therefrom, piston means mounted for longitudinal sliding movement in said housing and cooperating therewith to provide first and second expandable and contractible fluid chambers in said housing, passage means for supplying and exhausting pressure fluid from said chambers, rotatable worm means extending axially through said piston means and threadedly connected thereto, gear means operatively interconnecting said piston means and said output member so that movement of said piston means will produce movement of said output means, lock nut means threaded on said worm means, spring means interposed between said lock nut means and said piston means and operatively connected therebetween to provide rotational restraint to said lock nut means with respect to said piston means while providing an axial force urging said piston means and said lock nut means in opposite axial directions to thereby load opposing flanks of the threads of a threaded connection between said worm means and said piston means and between said worm means and said lock nut means to thereby reduce lost motion in the threaded connections.

4,294,160

OIL PRESSURE BOOSTER

Yasufumi Ideta; George Takeda, both of Tokyo, and Shoei Watanabe, Koganei, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 11, 1980, Ser. No. 120,652
Claims priority, application Japan, Feb. 14, 1979, 54-15015
Int. Cl.³ F15B 9/10
U.S. Cl. 91—378 **3 Claims**



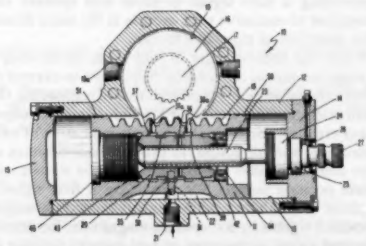
1. An oil pressure booster comprising a booster body with an inlet port, an outlet port, and a drain port; a power piston fitted in said booster body; a spool fitted in said power piston and operatively connected to a brake pedal; a throttle valve, a return path valve and a control valve defined between said power piston and said spool so as to close and open in response to movement of said spool; and a boost chamber defined in said booster body and normally communicating with said drain port through said return path valve; said throttle valve throttling flow of operating oil supplied from said inlet port in response to depression of the brake pedal so as to generate an oil pressure upstream of said throttle valve, said control valve selectively allowing passage of said oil pressure to said boost chamber for causing said power piston to follow the movement of said spool in a depressing direction of the brake pedal, wherein in response to movement of said spool in said depressing direction of the brake pedal, said throttle valve is closed at first and then said return path valve is closed and thereafter said control valve starts to open.

4,294,161

POWER STEERING GEAR WITH OIL FILLED CAPILLARY BALANCING SLOTS

Peter H. Sheppard, c/o R. H. Sheppard Co., Inc., Hanover, Pa. 17331

Filed Dec. 29, 1978, Ser. No. 974,347
Int. Cl.³ F15B 11/08
U.S. Cl. 91—422 **10 Claims**



1. An improved piston and cylinder combination of a hydraulic power steering gear comprising a housing defining a

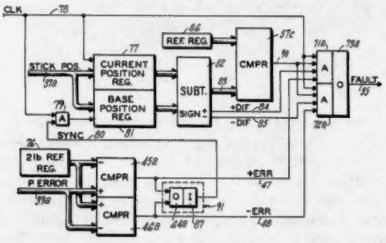
cylinder, a piston slidably mounted within the cylinder; a slot formed in at least one of said piston or cylinder at the sliding interface and open only at said interface, and means to feed pressurized hydraulic fluid adjacent the ends of said cylinder to actuate said piston and to said slot to balance and cushion the piston, said slot having a depth of approximately between 0.001 and 0.0025 inch thereby being sufficiently shallow to set up high capillary attraction of the fluid molecules within the slot, whereby the fluid is trapped within the slot and leakage is prevented.

4,294,162

FORCE FEEL ACTUATOR FAULT DETECTION WITH DIRECTIONAL THRESHOLD

Donald W. Fowler, West Haven, and Douglas H. Clelford, Trumbull, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 23, 1979, Ser. No. 60,093
Int. Cl.³ F15B *13/14, 13/16*
U.S. Cl. 91—434 **4 Claims**



1. An improved fault detector for a force feel system having an hydraulic actuator responsive to the difference in pressure of hydraulic fluid applied to opposite ends thereof through a turn-on valve to apply force in either of two directions to the control stick of an aircraft, the fault detector including:

means for providing a desired force signal indicative of the force desired to be applied to the control stick by the actuator;

means for providing an actual force signal indicative of the force applied by the actuator to the control stick;

error means responsive to said desired force signal and said actual force signal for providing force error signals indicative of the magnitude and direction of the difference between the desired force and the actual force applied by said actuator;

position means for providing control stick position signals indicative of the position of said control stick; and

signal processing means connected to said position means and said error means, and responsive to the amount and direction of control stick motion, which occurs directly subsequent to said error means generating a signal indicative of an excessive force in either of said directions, for providing a fault signal to close said turn-on valve in response to excessive stick motion in the same direction as the direction of excessive force;

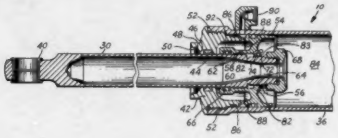
in which the improvement in said signal processing means comprises means continually responsive to current ones of said control stick position signals for registering the control stick position indicated by said signals in response to said error means providing signals indicative of excessive force in either direction, to provide base position signals, for comparing said control stick position signals with said base position signals, for providing a first signal in response to said base position signals exceeding said current position signals by a threshold magnitude, for providing a second signal in response to said current position signals exceeding said base position signals by a threshold magnitude, and for generating said fault signal in response to said error means providing signals indicative of excessive force in a first direction concurrently with said first signal or in response to said error means providing signals indicative of excessive force in a second direction concurrently with said second signal.

4,294,163

NON ADJUSTABLE HYDRAULIC CYLINDER

Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 29, 1979, Ser. No. 88,943
Int. Cl.³ F01B *7/20;* **F16J** *1/10*
U.S. Cl. 92—52 **4 Claims**



1. A dual acting hydraulic actuator primarily for the actuation of aircraft landing gear including:

a hydraulic cylinder having first and second ports for flowing fluid in and out thereof, a first end having a gland therein, and a second end having an attachment fitting;

a rod having first and second end portions and a central cylindrical portion of predetermined diameter therebetween, said first end portion having a rod end thereon and said central cylindrical portion being positioned to slide through said gland; and

a piston mounted to said second end portion of said rod for limited sliding movement a predetermined distance with respect thereto and sliding movement in said hydraulic cylinder in response to fluid pressure applied through said first and second ports, said piston including first and second abutment surfaces, said rod second end portion having first and second abutment surfaces positioned to engage said first and second abutment surfaces of said piston, said first and second abutment surfaces of said piston being closer together than said first and second abutment surfaces of said rod second end portion so that said predetermined distance of relative movement between said piston and said rod is defined by the difference therebetween, said rod second end portion also including an end cylindrical portion between said first and second abutment surfaces thereof, said end cylindrical portion having a diameter which is less than the diameter of said central cylindrical portion, and said piston further including first and second interior cylindrical surfaces which slide on said central cylindrical portion and said end cylindrical portion of said rod respectively, said piston and said rod defining a damping chamber between said first and second interior cylindrical surfaces, and at least one damping orifice establishing a flow path between said damping chamber and one of said ports.

4,294,164

PISTON FOR USE IN PNEUMATICALLY OPERATED PISTON-CYLINDER APPARATUS

Kurt Stoll, Lenzhalde 72, 7300 Esslingen, N., Fed. Rep. of Germany

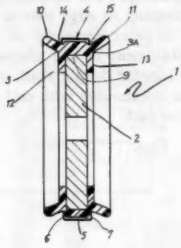
Filed Dec. 4, 1979, Ser. No. 100,068
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1978, 7836994[U]
Int. Cl.³ F16J *9/08*
U.S. Cl. 92—243 **4 Claims**

1. A piston for operating cylinders which are to be operated utilizing compressed air, comprising:

a rigid cylindrical core member adapted to be connected to a piston rod;

an annular sealing ring of elastic material mounted around

and completely enclosing the peripheral edge of said core, said sealing ring having a pair of radially inwardly and axially spaced flange parts tightly engaging opposite axially facing sides of said core, said sealing ring further having a central web member integrally connecting the radially outer extremity of said flange parts and tightly engaging the radial periphery of said core, said sealing ring further having a pair of annular sealing lips integrally connected at the juncture between each flange part and said central web member and at a location spaced radially inwardly from the radially outermost extremity of said central web member to thereby define first and second



radially outwardly opening, axially spaced recesses, each of said sealing lips being outwardly inclined relative to the axially facing sides of said core and terminating at a location whereat the diameter is of greater dimension than the diameter of said central web member; and

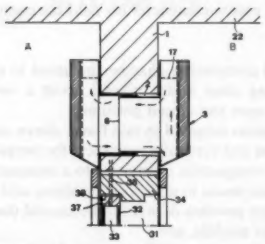
a resilient annular guide ring having a generally channel-shaped cross section having a central bight portion and a pair of axially spaced legs, each of said axially spaced legs being received in a respective one of said first and second recesses to thereby prevent said guide ring from moving axially relative to said sealing ring, said guide ring being slotted to facilitate an installation of said guide ring on said sealing ring.

4,294,165

ARRANGEMENT TO COUNTERACT OR PREVENT SPREADING OF FIRE OR SMOKE

Knut Bergdahl, Kvartsgrand 4, S-852 52 Sundsvall, Sweden

Filed May 4, 1979, Ser. No. 35,824
Claims priority, application Sweden, May 8, 1978, 0519/78
Int. Cl.³ F16K *9/00*
U.S. Cl. 98—1 **5 Claims**



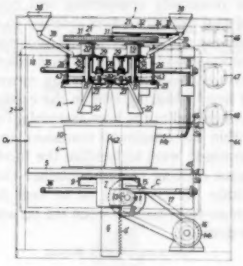
3. An arrangement to counteract or prevent the spreading of fire or smoke comprising means for defining a partition between two chambers of a static structure, means for defining an aperture in said partition for normally placing said two chambers in fluid communication with each other, means for normally maintaining said aperture open while being operative to close said aperture in response to the detection of fire or smoke, said last-mentioned means including a drain trap-like conduit portion through which air can normally flow to pass through said aperture between said two chambers, means for detecting a predetermined level of smoke or temperature, means for responding to said detecting means for filling and closing said drain trap-like conduit portion with a noncombustible fluid thereby closing communication between said two chambers through said aperture, means defining a door aperture in said partition, a hollow door movable between a first position at which said door aperture is open and a second position at which said door aperture is closed, means for conducting a noncombustible fluid through said door aperture defining means and into said hollow door when the latter is in its second position, second means for detecting a predetermined level of smoke or temperature, and means responsive to said second detecting means for effecting the conducting of fluid through said conducting means.

4,294,166

APPARATUS FOR MIXING AND BAKING OF BREAD

Shigeo Takeuchi, 2-banchi, Kiba-cho, Minato-ku, Nagoya-shi, Aichi-ken, Japan

Division of Ser. No. 933,116, Aug. 9, 1978, Pat. No. 4,234,605. This application Jun. 6, 1980, Ser. No. 157,189
Claims priority, application Japan, Aug. 19, 1977, 52/99833
Int. Cl.³ B01F *7/24*; A47J *27/00*
U.S. Cl. 99—348 **6 Claims**



1. An apparatus for making bread which comprises a casing frame, an oven accommodated in said casing frame, a combined trough and baking-pan unit removably mounted in said oven, a water tank accommodated in said oven, oven heater means effective to heat water as held in said water tank to the same temperature as that of the oven interior, means for directing the water heated in said water tank into said combined trough and baking-pan unit, an agitating device in said oven having an agitator element, and lift means operable to move said combined trough and baking-pan unit and said agitating device vertically relative to each other thereby to place the agitator element of said agitating device into and out of said combined trough and baking-pan unit.

4,294,167

METHOD OF APPARATUS FOR CANNING FOOD PRODUCTS

Max P. Beauvais, 46 Southridge West, Tiburon, Calif. 94920, and Raymond E. Camezon, 623 Tunbridge Rd., Danville, Calif. 94526

Filed Dec. 26, 1979, Ser. No. 107,425
Int. Cl.³ A47J *27/08*
U.S. Cl. 99—369 **6 Claims**

1. Apparatus for canning food products, comprising

a container having a removable lid capable of forming an air-tight seal against the open upper extremity of said container under the influence of a lower than ambient pressure within said container;

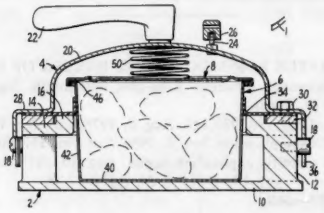
a pressure cover for covering the upper portions of said container and including

pressure sealing means for forming a pressure-tight engagement with portions of the sides of said container, whereby the combination of the pressure cover and the container so covered forms a completely enclosed pressure vessel;

means for resiliently urging said container lid downwardly against said upper extremity of said container;

pressure control means for limiting the maximum pressure differential between ambient and the pressure within said combined pressure cover and container to a predetermined level;

a base member; and



means for releasably connecting and restraining movement of said pressure cover relative to said base member, whereby a container and lid enclosing a food product, positioned and held by the base, may be engaged by the pressure cover and its sealing means when heat is applied from a heating unit to the containers, with the cover connected to the base assembly, for limiting pressure within the combined container and cover to the predetermined level to sterilize the food product, with subsequent cooling of the container causing the pressure within the container to be less than ambient to effect an air-tight seal between the lid and the container upper extremity.

4,294,168

INSERTABLE ARTICLE FOR ALTERING THE CURE RATE AND CHEMICAL COMPOSITION OF AN OBJECT

Walden K. Redhead, 3831 E. McGilvra St., Seattle, Wash. 98112

Filed Jul. 10, 1980, Ser. No. 167,773

Int. Cl.[3] A23B *4/02*; A23L *1/22*

U.S. Cl. 99—494 **7 Claims**

1. An insertable article for altering the cure rate and chemical composition of an object comprising in combination:

an elongate shaft,

recess means along the length of said shaft provided with support areas for carrying chemicals therein,

said shaft having one pointed terminus for facile insertion into the object,

said support areas and recess means communicating without said shaft whereby chemicals disposed therein gradually leach out into the object wherein said recess means comprise a spiral groove (5) running the length of said shaft around said shaft and wherein said support areas comprise pockets (4) along side edges of said groove, above and below, and having openings (6) facing said groove and wherein said pockets have a circular configuration in section with an open arc area facing said groove and a shoulder extending to edge portion of said groove, and linear with an outer periphery of said shaft to protect against displacement of the chemicals upon insertion, removal, or rotation of said shaft, and wherein said support area are coextensive with said groove and similarly follow a spiral path.

4,294,169

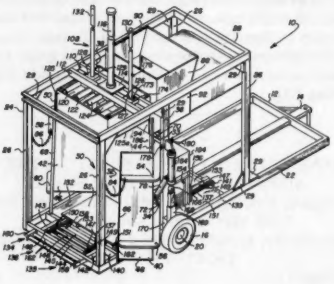
COTTON MODULE COMPACTER

Charles D. Baird, P.O. Box 976, Coleman, Tex. 76834

Filed Feb. 4, 1980, Ser. No. 117,826

Int. Cl.[3] B30B *15/30*

U.S. Cl. 100—48 **41 Claims**



1. A seed cotton compacter for field use comprising in combination;

a frame;

a vertical compaction chamber mounted to said frame and including door means pivotal about a vertical axis between open and closed positions;

tamper means mounted to said frame above said compaction chamber and vertically reciprocal for tamping seed cotton in said compaction chamber into a compact module with said door means in said closed position, said door means in said open position permitting horizontal discharge of said compact module; and

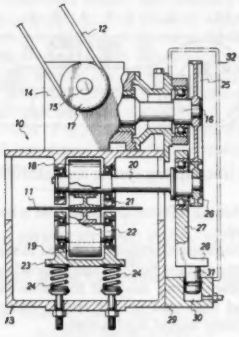
said door means comprising a pair of L-shaped doors forming in said closed position left, and right and rear generally vertical walls of said compaction chamber, said doors forming said left, right and rear walls of said compaction chamber being tapered outwardly and rearwardly from top to bottom, each door being pivotally mounted to said frame at its forwrd vertical edge and extending rearwardly to define a respective right or left sidewall, and then inwardly to define part of the rear wall and meet the facing edge of the other door.

4,294,170

ROLL FEED DEVICE FOR FEEDING MATERIAL TO A PRESS

Yuu Takahashi, Hachioji, Japan, assignor to Aida Engineering, Ltd., Sagamihara, Japan

Filed Jan. 24, 1980, Ser. No. 116,602
Claims priority, application Japan, Feb. 1, 1979, 54-10778[U]
Int. Cl.³ B30B *15/30*
U.S. Cl. 100—216 2 Claims



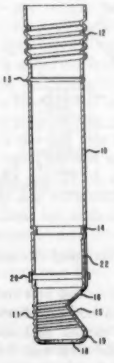
1. A roll feed device for feeding a material to a press in a predetermined timed relationship to the operation of the press, said device comprising a pair of feed rolls between which the material is fed, one being an idle roll and the other being a driven roll, a drive shaft on said driven roll, an intermittent rotating mechanism operably associated with the drive of the press and having an output shaft, friction disk means easily removably mounted on said shafts and having the peripheral edges in frictional engagement with each other for driving said drive shaft from said output shaft and pressure means for urging the peripheral edges of said disk means into contact with each other, whereby an infinite number of feeding pitches can be provided by replacing the disks with other size disks.

4,294,171

EXPLOSIVES PACKAGE FOR COUPLED CAST PRIMER COMPOSITIONS

Gilles H. Ducharme, North Bay, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 21, 1979, Ser. No. 77,543
Claims priority, application Canada, Sep. 21, 1978, 311787
Int. Cl.³ C06B *11/00*
U.S. Cl. 102—317 12 Claims



1. A container for explosives adapted for interconnection with like containers to form a column, comprising a thin-walled elongated substantially cylindrical plastic tube open at both ends, said tube being provided with

(a) a male coupling at one end of the tube;

(b) a female coupling at the other end of the tube adapted to couple and retain a male coupling at the end of a like container;

(c) a circumferential groove inside the tube adapted to retain a closure disc within the tube adjacent the female coupling, between the male and female coupling;

(d) a circumferential ring seat extending into the tube and adapted to form a liquid-tight joint with a piston during casting of a high explosive into the tube, said ring seat being positioned between the circumferential groove and the male coupling; and

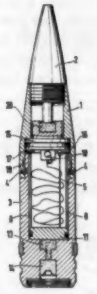
(e) a hole in the wall of the tube, adapted to receive and retain a thin-walled capwell thimble entirely between the ring seat and the end of the container having the male coupling.

4,294,172

PROJECTILE WITH RECOVERABLE DETONATOR

Willi Rauschert, Altensittenbach; Gerald Rieger; Erich Bock, both of Nuremberg, and Alfred Eckel, Treuchtlingen, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,133
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1978, 2824203
Int. Cl.³ F42B *11/22*
U.S. Cl. 102—473 6 Claims



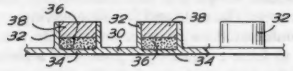
1. Projectile including a detonator (2) recoverable to provide function control, wherein an aerodynamic brake arrangement (5) located interiorly of the projectile body (3) is mounted on a projectile upper portion (1) supporting the detonator (2) and which is fastened to the projectile body (3), and a piston (11) is supported within the projectile body (3) which propels the projectile upper portion (1) out of the projectile body (3) at the ignition of apropellant charge (13), characterized in that the projectile body is formed by a projectile shell (3), the propellant charge (13) is arranged in the projectile shell (3) at the side of the piston (11) facing away from the projectile upper portion (1), and the piston (11) impacts against and the projectile upper portion (1) through half-shells (8) which extend about the brake arrangement (5), ram means being arranged in said projectile upper portion said ram means having a limited path of movement, and said brake means being fastened thereto; a further ejector charge in said upper portion being located against the side of said ram means opposite the projectile shell (3), and said ejector charge being detonated by said detonator (2).

4,294,173

AMMUNITION FOR A TOY WEAPON

Giampiero Ferri, Via Stoppani 38, Florence, Italy

Filed Jun. 4, 1979, Ser. No. 44,904
Claims priority, application Italy, Jun. 7, 1978, 9492 A/78
Int. Cl.³ F42B 4/02
U.S. Cl. 102—281 1 Claim



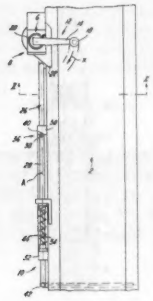
1. A process for the production of ammunition for toy-weapons, said process comprising the steps of forming a support having a plurality of seats for explosive charges, by injection moulding a plastics material, depositing explosive charges in said seats, arranging the support with the explosive charges in a second injection mould, and forming, in said second mould, a separate cover for each said seat using a plastics material which is fused to the seat, said covers being injected simultaneously, but separately.

4,294,174

VEHICLE SYSTEM WITH SPEED-RESPONSIVE STOP

Gerhard H. Todt, Alling-Biburg, Fed. Rep. of Germany, assignor to Buro Patent A.G., Glarus, Switzerland

Filed Mar. 24, 1980, Ser. No. 132,767
Claims priority, application Switzerland, Mar. 23, 1979, 2753/79
Int. Cl.³ B61B 7/8, 7/00
U.S. Cl. 104—250 10 Claims



1. A mechanical stop mechanism for a vehicle system having a track defining a vehicle path and at least one vehicle displaceable along said path, said mechanism comprising:

an arm pivotally mounted alongside said path at an axis transverse thereto and adapted to extend into said path for engagement by said vehicle whereby said arm is swung by said vehicle about said axis at an angular velocity determined by the speed of said vehicle;

a centrifugal clutch having an output element, said clutch being connected to said arm and having a threshold velocity for clutch engagement whereby said output element of said clutch is rotatably entrained by said arm upon the angular velocity thereof exceeding said threshold velocity;

a restoring spring connected to said arm for biasing same into a position wherein said arm extends into said path; and

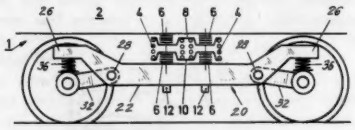
a stop member triggered upon movement of said output element into a position wherein said stop member engages said vehicle and holds the same along said path.

4,294,175

SWIVEL-TRUCK SPRING SYSTEM FOR RAILROAD USE

Gabor Harsy, Neuhausen, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Switzerland

Filed Apr. 2, 1979, Ser. No. 26,405
Claims priority, application Switzerland, Apr. 10, 1978, 3819/78
Int. Cl.³ B61F 3/08, 5/30
U.S. Cl. 105—199 R 25 Claims



1. A swivel truck spring system for a railroad car, or the like, comprising:

a truck, including a frame and rotatable wheels supported on said frame;

first and second spring means arranged in series between said truck frame and the body of the railroad car, with said first spring means being adapted for absorbing vertical load forces and with said second spring means being adapted for absorbing lateral load forces;

said first and said second spring means being laterally spaced apart and being near each other, thereby to take up both vertical and lateral forces, while minimizing the height of the combined structure of said first and said second spring means;

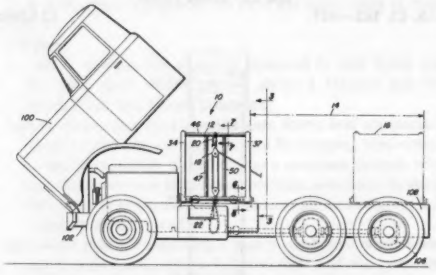
a pair of normally spaced apart spring washers for each set of said first and said second spring means; said spring washers extending laterally between said truck frame and the body of the railroad car, or the like; said first spring means being between said spring washers and said second spring means comprising one second spring between the uppermost said washer and the car body and another second spring between the lowermost said washer and said truck frame.

4,294,176

PORTABLE HOIST FRAME

Albert C. Brooks, 2023 W. Lexington St., Baltimore, Md. 21223

Filed Apr. 4, 1979, Ser. No. 26,815
Int. Cl.³ B61D 17/00
U.S. Cl. 105—363 10 Claims



1. An easily assembled and dis-assembled portable hoist frame comprising:

a first end frame means, said first end frame means having a top and bottom and side members;

a second end frame means, said second end frame means being similar to said first end frame means and spaced therefrom;

a first horizontal frame means, said first horizontal frame

means having a vertically inclined strut member, said first horizontal frame means being connected to said first and second end frame means at both the top and at the bottom of said first and second end frame means;

a second horizontal frame means, said second horizontal frame means having a vertically inclined strut member connected to said first horizontal frame means, said second horizontal frame means being connected to said first and second end frame means at the bottom of said first and second end frame means;

a plurality of wheel-like means, said plurality of wheel-like means being attached to said first and second horizontal frame means to provide positioning flexibility to said portable hoist frame in a first direction of movement; and

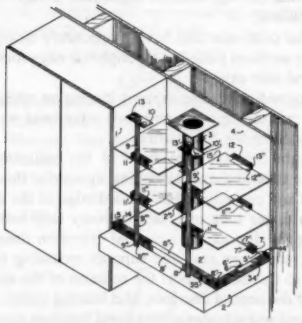
a plurality of clip means, said plurality of clip means being attached to said first and second end frame means to secure said portable hoist frame against a movement in a second direction of movement perpendicular to said first direction of movement when being positioned on said wheel-like means.

4,294,177

SUPPORT BRACKET AND OPEN SHELVING ASSEMBLY

James A. Nicholson, 10600 Van Stralen Way, Rancho Cordova, Calif. 95670

Filed Nov. 14, 1977, Ser. No. 851,299
Int. Cl.³ A47B *37/00*
U.S. Cl. 108—42 **5 Claims**



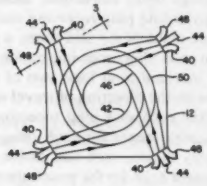
1. In combination with a wall cabinet, a back wall and a ceiling, a ventilator hood and a standing exhaust pipe; a support bracket and open shelving assembly wherein said assembly consist of an elongated first bracket and a second bracket with both said bracket having upper and lower base extensions and with said extensions opposingly spaced apart on said first and second brackets and, with said brackets in attachment with said upper and lower base extensions of both said brackets facing inwardly of each other to form a right angle facing primary bracket with said bracket having attachment means at each end of said primary bracket and on the lower base extension, also alternate attaching means; two elongated vertical posts in attachment with the said first bracket with said posts substantially square in cross section and in attachment with said first bracket by one corner of said vertical posts in a spaced apart relationship and with each said post having ceiling attaching means at their top ends also, alternate attaching means of said vertical posts to said first bracket; a plurality of shelving support brackets having upper and lower spaced apart extensions comprising two basic sets of brackets, a first set is attachable to the said vertical posts and, a second set which has attachable means to a back wall, two alternate shelf support means; a plurality of dampener devices affixed inwardly of the aforesaid shelf support brackets to include, one alternate mode of shelf support also, a plurality of chatter pads for association with the said dampener devices and said shelf support brackets; a plurality of preferably transparent rectangular shelving in association with said brackets and components within said brackets and, two stabilizer anchorage means.

4,294,178

TANGENTIAL FIRING SYSTEM

Richard W. Borio, Somers, and Arun K. Mehta, Windsor Locks, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 12, 1979, Ser. No. 57,049
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—347 **2 Claims**



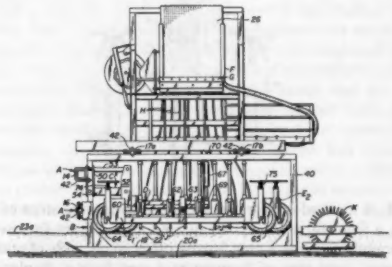
1. The method of operating a furnace having four walls, a first set and second set of nozzle means, with each set having nozzle means located in each of the four corners of the furnace, the method of operation comprising introducing pulverized coal and primary air into the furnace through the first set of nozzle means in such a manner that the streams of coal and primary air are directed tangentially to a first imaginary, substantially horizontal, circle in the center of the furnace, introducing secondary air into the furnace through the second set of nozzle means in such a manner that the stream of secondary air are directed tangentially to a second imaginary circle spaced from, concentric with, and surrounding the first imaginary circle, in order to reduce NO_x in the exhaust gases, and also maintain an oxidizing atmosphere adjacent the furnace walls, thus reducing slagging and corrosion of the furnace walls.

4,294,179

DIBBLE TUBE SOIL PLUG PLANTER

David W. Cayton; Errol C. Armstrong, and Angus B. MacKenzie, all of Salinas, Calif., assignors to Bud Antle, Inc., Salinas, Calif.

Filed Aug. 1, 1979, Ser. No. 62,667
Int. Cl.³ A01C *11/02, 5/04*
U.S. Cl. 111—3 **3 Claims**



1. Apparatus for the transplant of plant containing plugs from trays into a field having elevated seed beds contained between paired furrows, said apparatus comprising: a transport frame having first and second ground support members for passage within said furrows, said furrows having at least one plant bed defined between said furrows; at least one planting chassis suspended from said transport frame; a plug extractor

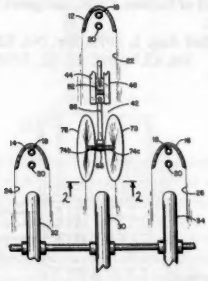
supported on said transport frame; said plug extractor including means for registering columns of plant containing plugs from a vertically supported and adjustable rigid carrying tray mounted on a horizontally adjustable support frame, said tray having rows and columns of plant containing plugs for extraction from said tray; said rigid carrying tray forming the sole support for said plugs; plug extractors, including ejectors, for contacting a group of plugs in a column of plugs from one side of said tray to cause the horizontal discharge of plugs to a plurality of plug receiving stations on the opposite side of said tray; a member defining said plurality of plug receiving stations, each station registered to said tray at a position of extraction of said plugs; said member juxtaposed to said tray to receive said plugs upon extraction; means for moving said member to register said plug receiving stations to plug receiving tubes; dibble planters for said tubes; a plug receiving tube extending from each plug receiving station to and towards one dibble planter mechanism at least two of said dibble planters being aligned with the direction of travel of said apparatus; air supply means for each said plug receiving tube; said chassis including a registry means for each tube; a dibble planter at each said registry means, each said dibble planter including a first solid sectioned cylinder for penetration into the ground to define within said ground a ground aperture the size and volume of said plug; a second hollow sectioned cylinder reciprocal about the first cylinder for receiving interiorly said first cylinder to hold the ground adjacent to said first cylinder; said registry means including horizontal sliding means for vertical registry of said tube to said second hollow sectioned cylinder when said first cylinder is withdrawn to permit air assisted gravity discharge of plugs within said tubes into the ground aperture in said ground whereby when said second cylinders are retracted, said plug resides in said ground.

4,294,180

GRAIN DRILL WITH DEVICE FOR PREVENTING UNDESIRED BACKFILLING OF FRONT FURROW BY REAR FURROW OPENERS

Waldo H. Pust, Savage, Mont. 59262

Filed Oct. 31, 1979, Ser. No. 89,911
Int. Cl.³ A01C *5/00*
U.S. Cl. 111—52 **12 Claims**



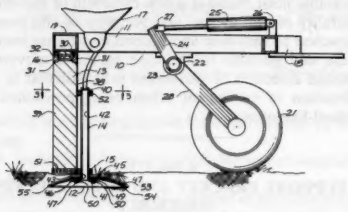
1. A method of planting seed comprising the steps of forming a front furrow, depositing seed in said front furrow, concurrently forming a rear furrow offset to one side of said front furrow, said step of forming said rear furrow displacing or shifting soil from said rear furrow in the direction of said front furrow, depositing seed in said rear furrow, preventing the soil displaced or shifted from said rear furrow as it is formed from entering said front furrow by employing disc means for deflecting soil displaced or shifted from said rear furrow, thereby preventing undesired backfilling of said front furrow, and covering the seed in said front furrow with some of the soil forming said front furrow.

4,294,181

SUBSOIL AGRICULTURAL IMPLEMENT WITH ROTATABLE DISC

Franklin Smith, Potlatch, Id.

Continuation-in-part of Ser. No. 950,124, Oct. 10, 1978, abandoned. This application Jun. 9, 1980, Ser. No. 157,805
Int. Cl.³ A01C *7/20*; A01B *33/06*
U.S. Cl. 111—87 **8 Claims**

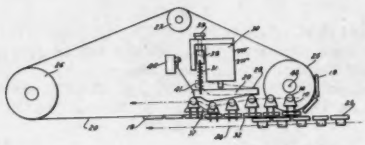


1. A subsurface agricultural implement comprising:
a framework;
a circular cultivator disc having oppositely facing upper and lower surfaces joined at a peripheral edge formed about a central disc axis;
an elongated rigid disc support having an upright forward edge and an upright rearward edge, and an upper end mounted to the framework;
an upright delivery tube fixed to the cultivator disc at a lower tube end and extending upwardly therefrom centered and preceding the forward edge of the disc support to an upper tube end, said delivery tube being centered along the disc axis as a coaxial extension thereof;
bearing means on said disc support mounting the delivery tube to the disc support for rotation of the delivery tube about the central disc axis, said bearing means comprising first and second coaxial rotational bearings mounted to the disc support at two axial spaced locations with an exposed section of the tube between said bearings, one of which is located on said disc support elevationally adjacent said disc at said lower tube end;
an open bore extending through the delivery tube from its upper end to its lower tube end;
said disc including a central opening formed therein in alignment with the open bore;
means on said framework for lowering the disc to an elevation below the soil surface;
means for causing rotation of the disc and delivery tube about the central disc axis in response to forward movement of the framework while the disc is elevationally below the ground surface;
means on said framework for directing a flowable material to the open bore at the upper tube end; and
trash clearing means on the delivery tube for preventing buildup of trash against the disc support as it is moved along the ground;
a pivot bracket and pin joining an upper end of the disc support to the framework for transverse pivotal movement about a longitudinal axis; and
spring means interconnecting the disc support and said framework for normally urging the disc support toward an upright position.

4,294,182
DEVICE FOR APPLYING THREAD STAPLES TO FOLDED SHEETS

Winfried Böttcher, and Kurt Germer, both of Leipzig, German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 72,294, Sep. 4, 1979. This application Sep. 13, 1979, Ser. No. 75,000
Claims priority, application German Democratic Rep., Sep. 4, 1978, 207622
Int. Cl.³ B42B *1/02*
U.S. Cl. 112—21 6 Claims

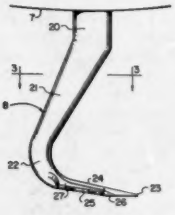


1. A device for applying thread staples to folded sheets, comprising means for feeding said sheets in a plane; an endless chain having a section travelling in said plane in the feeding direction of the sheets; a plurality of thread feeding plates attached to said chain and each carrying a length of the thread corresponding to a staple to be formed; a pair of needles supported on each plate and guided for a reciprocating movement relative to said threads and said sheet; and stationary cam means operable to impart said reciprocating movement to said needles during the travel of said chain.

4,294,183
CUTTER CONFIGURATION FOR EFFICIENT ICE DISAGGREGATION AND CLEARING

George W. Morgan, San Jose, Calif., assignor to Suncor Inc., Toronto, Canada

Filed Apr. 14, 1980, Ser. No. 139,960
Int. Cl.³ B63B *35/12*
U.S. Cl. 114—42 4 Claims



4. An ice engaging tooth structure adapted to be affixed to and carried by a rotatable ice disaggregating drum, said tooth structure including:

(A) a base portion extending outwardly from the peripheral surface of said drum;

(B) an intermediate portion effecting a continuation of said tooth structure from said base portion, said intermediate portion being angled rearwardly with respect to the direction of drum rotation during ice disaggregating operations;

(C) a forwardly sweeping arcuate portion effecting a continuation of said tooth structure from said intermediate portion; and

(D) an ice engaging portion effecting a continuation of said tooth structure from said arcuate portion, said ice engaging portion comprising:

(i) an inverted skate element oriented along the centerline of said ice engaging portion, said inverted skate element having an edge generally facing the peripheral surface of said drum;

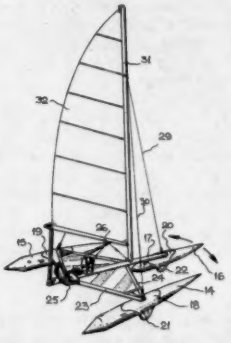
(ii) wing-like projections extending outwardly, respectively, on first and second sides of said inverted skate element and oriented generally parallel to the axis of said drum, said wing-like projections terminating at their forward ends in ice engaging chisel-like leading edges; and

(iii) a centrally disposed pick element generally aligned with said inverted skate element and extending forwardly beyond said chisel-like leading edges of said wing-like projections.

4,294,184
MULTI-HULL STEERING SYSTEM

Bernd Heinrich, Flat 27, 40 Spofforth St., Cremorne, N.S.W., Australia (2090)

Filed Apr. 6, 1979, Ser. No. 27,821
Claims priority, application Australia, Apr. 11, 1978, PD3976
Int. Cl.³ B63B *1/00*
U.S. Cl. 114—61 6 Claims



1. A multi-hull craft steering system comprising:

a frame member;

a plurality of hulls each constructed from flexible envelopes pneumatically inflated to obtain buoyancy, said hulls being supported by a trunion mounted to said frame member, each of said trunions having a hollow body enveloping one of said flexible envelopes near a mid-region of said envelopes, the upper surface of each of said hollow bodies extending longitudinally to a greater extent than the remainder of said bodies, wherein one of said hulls is a middle steering hull pivotally mounted for controlled angular variation in azimuth, said middle hull located ahead of the remaining hulls to at least an extent sufficient to permit rotation of said middle hull to avoid interference with the bows of the remaining hulls during such angular variation whereby said craft is steered;

said outer hulls having a variable track therebetween, whereby said hulls are selectivley locatable in a discrete number of locations;

a locking means for maintaining said hulls at one of said locations; and

means for angularly rotating the outer hulls away from the longitudinal axis of said craft about a hinge means connected to said frame from a first working position to a second stowed position, said stowed position permitting transportation and storage of said craft.

4,294,185

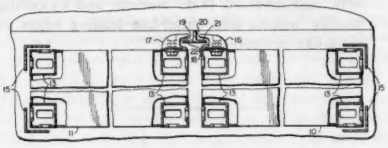
SYSTEM FOR SECURING CONTAINERS IN A SHIP'S HOLD

Immo R. Nordstrom, P.O. Box 305, Fair Haven, N.J. 07701, and Johannes A. Bak, Prunuslaan 41, Dordrecht, Netherlands

Continuation-in-part of Ser. No. 830,500, Sep. 6, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,767

Int. Cl.³ B63B *25/08*

U.S. Cl. 114—75 **20 Claims**



1. An apparatus for securing containers in a storage or cargo cell in a ship's hold wherein the containers are of substantially equal length and the storage cell is greater in length than the combined lengths of two such containers, the storage cell having a bottom wall and vertical side and end walls, and wherein each of the containers is of a type having corner pieces as a structural part of the container, each said corner piece having an elongated side opening therein, the apparatus comprising

guide means structurally attached to a vertical side wall of the storage cell for guiding the containers

said guide means having elongated flange portions extending vertically upwardly from a location adjacent the bottom wall thereof;

first and second guide hooks;

and means for detachably mounting each of said guide hooks in an opening in a corner piece of each of the containers on the same side as, and at the end closest to, the other container,

each of said guide hooks having a recess portion directed toward the other guide hook,

whereby said hooks lie on opposite sides of, and partially enclose, said flange portions of said guide means.

4,294,186

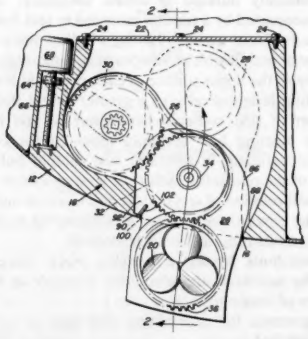
RETRACTABLE BOW THRUSTER

Gerald S. Wardell, 2249 SW. 68th Ter., Miramar, Fla. 33023

Filed Jan. 25, 1980, Ser. No. 117,219

Int. Cl.³ B63H *25/42*

U.S. Cl. 114—151 **14 Claims**



1. A retractable thruster for use in providing lateral thrust for steering a vessel, comprising:

a main housing;

a first gear housing disposed within said main housing;

a drive gear mounted for rotation within said first gear housing, said first gear housing having mounting means for providing a pivotal connection to said main housing, said pivotal connection allowing said first gear housing to pivot about the axis of rotation of said drive gear;

a propeller;

drive means connected between said drive gear and said propeller for causing rotation of said propeller upon rotation of said drive gear; and

connection means operatively connecting said propeller to said first gear housing for causing said propeller to move up and down within said housing upon pivotal movement of said first gear housing.

4,294,187

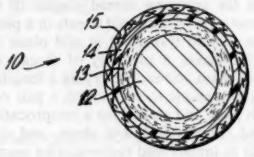
APPLICATOR FOR DIRECT ROLL COATING

Ozzie Fogle, Orangeburg, S.C., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 900,819, Apr. 27, 1978, abandoned. This application Jun. 5, 1980, Ser. No. 156,818

Int. Cl.³ B05C *1/00*

U.S. Cl. 118—244 **7 Claims**



1. An apparatus for continuous direct roll coating of textured panels or sheet-like members comprising in combination: a roll applicator; means for continuously applying coating material to said applicator, and means for continuously bringing the panels into contact with said applicator, said applicator including a central core; a relatively thick layer of soft, fibrous, compressible and pliable material having a web construction held together by a binding adhesive, said fibrous layer being disposed over said core enabling said applicator to follow contoured surfaces; a very thin protective tube member disposed around said layer of fibrous web material to prevent coating material from penetrating said fibrous web material, said tube member being of an impervious material; and a very thin layer of woven fabric material disposed over said protective tube member, said layer of woven fabric material absorbing a coating for application by said applicator, said means for continuously applying coating material to said applicator including a reservoir for containing the coating material, a first roller partially immersed in said reservoir, a second roller immediately adjacent said first roller and engaged therewith, said second roller also being immediately adjacent to and engaged with said applicator, and means for rotating said first and second rollers and said applicator such that said first roller and said applicator rotate in the same direction, and said second roller rotates in the opposite direction to that of said first roller and applicator.

4,294,188

HYDRAULICALLY OPERATED ACCESS EQUIPMENT

Denis H. Ashworth, Dudley, England, assignor to Simon Engineering Dudley Limited, West Midlands, England

Continuation of Ser. No. 824,822, Aug. 15, 1977, abandoned. This application Sep. 24, 1979, Ser. No. 78,183

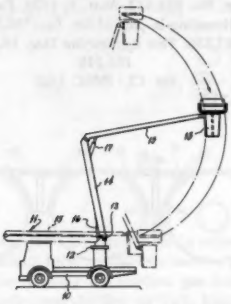
Claims priority, application United Kingdom, Aug. 21, 1976, 34923/76

Int. Cl.³ B05C *5/00*

U.S. Cl. 118—305 **8 Claims**

1. Hydraulically operated access equipment comprising a supporting structure such as a vehicle, a boom structure, a turntable rotatable about a vertical axis on said supporting

structure and on which at least a part of said boom structure is pivotally mounted for movement about a horizontal axis, hydraulic actuating means for said boom structure whereby the boom structure may be moved about its horizontal pivot between a generally horizontal stowed position on said supporting structure and an elevated position wherein its outermost end is raised above said supporting structure, a frame or housing mounted on said boom structure at the outermost end thereof, treatment means carried by said frame or housing for cleaning or applying a coating to an adjacent surface, means in said hydraulic actuating means effective to swing said boom structure to cause said treatment means to traverse said surface in substantially vertical arc paths, surface-engaging means on



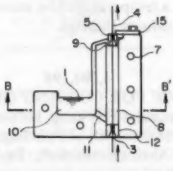
said frame or housing adapted to maintain said frame or housing at a fixed distance from said surface when the equipment is in use and as said boom structure is moved to cause said treatment means to traverse said surface, and means for imparting a continuous rotational drive to said vertical axis turntable during movement of said treatment means in said paths whereby to continuously bias said boom structure and frame or housing means toward said surface to thereby positively cause said surface-engaging means to be maintained in contact with said surface during all operational movement of said treatment means in said paths, said means for imparting a continuous rotational drive to said vertical axis turntable further comprising means to permit the means for imparting the rotational drive to slip during operation.

4,294,189

APPARATUS FOR COATING WIRES WITH PAINT

Hiroshi Ashida, and Fumitake Takahashi, both of Nagoya, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 27, 1980, Ser. No. 125,053
Claims priority, application Japan, Mar. 19, 1979, 54-31999
Int. Cl.³ B05C *3/12*
U.S. Cl. 118—603 **5 Claims**



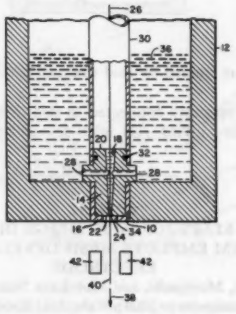
1. An apparatus for coating wires with paint comprising: at least one chamber for holding paint to be applied to said wires and adapted for said wires to pass therethrough, a discharge outlet being provided in each said chamber for allowing said paint to be discharged from an upper portion of each chamber; a coating die disposed in said upper portion of each said chamber; paint pool holding means for receiving discharged paint from said aperture of each said chamber, said paint pool holding means being provided externally of, and laterally displaced from said chambers and below said paint dies, and said paint pool being in fluid communication with a lower portion of each said chamber, and wherein the cross-sectional area of each said chamber is sufficiently small such that the temperature gradient of the paint within each chamber is minimized.

4,294,190

METHOD OF COATING OPTICAL WAVEGUIDE FILAMENTS AND COATING DIE

James W. Ohls, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 46,232, Jun. 7, 1979, Pat. No. 4,246,299.
This application Mar. 20, 1980, Ser. No. 132,259
Int. Cl.³ B05C *3/12*
U.S. Cl. 118—620 **11 Claims**



1. An apparatus for coating an optical waveguide filament comprising

a reservoir for containing a quantity of coating material, the bottom thereof defining an aperture,

a die body disposed within said aperture in said reservoir, said die body defining an at least partly tapered central longitudinal aperture extending from the top surface thereof to the bottom surface thereof,

means intermediate said top surface and said bottom surface of said die body communicating between said central longitudinal aperture and the interior of said reservoir for flowing said coating material into said central longitudinal aperture and for maintaining the level of said coating material in said central longitudinal aperture at a point intermediate said-top and bottom surfaces of said die body but not above said top surface when said filament is passed through said central longitudinal aperture and said coating material contained therein, and

means extending past said top surface of said die body for shielding said top surface from the interior of said reservoir.

4,294,191

SPRAY BOOTH

Ingemar Lööf, Fabriksgatan 6, S-560 10 Skillingaryd, Sweden

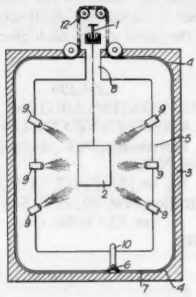
Filed Dec. 6, 1979, Ser. No. 100,750
Claims priority, application Sweden, Dec. 6, 1978, 7812532
Int. Cl.³ B05C *15/00*
U.S. Cl. 118—634 **11 Claims**

1. A spray booth comprising:

a housing having an internal surface and at least one opening for introducing an object to be spray-covered by a spray material,

said housing having opposed first and second ends and first and second guide means disposed at such ends,

an inlet device movable within said housing and having an inlet opening facing said internal surface of said housing for receiving spray material which has not adhered to said object, said inlet device including first and second end portions



which are guided by said first and second guide means, and

drive means operably connected to said first and second end portions for moving said inlet device along said internal surface.

4,294,192

LIQUID ELECTROSTATIC IMAGE DEVELOPING SYSTEM EMPLOYS MESH DEVELOPMENT ELECTRODE

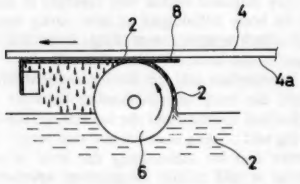
Syunzi Nakai, Moriguchi, and Motokazu Nakao, Sakurai, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

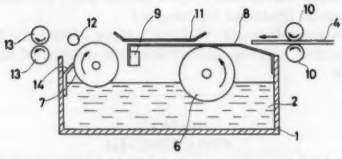
Filed May 28, 1980, Ser. No. 154,016

Claims priority, application Japan, May 30, 1979, 54-67632

Int. Cl.³ G03G *15/10*

U.S. Cl. 118—650 **7 Claims**





1. A liquid development system for developing an electrostatic latent image formed on a copy paper through the use of a developer liquid, said liquid development system comprising in combination:

a mesh shaped development electrode disposed in the traveling path of a copy paper above a developer liquid reservoir;

a liquid developer supplying means for supplying the developer liquid from said reservoir to said mesh shaped development electrode; and

a copy paper feed means for transferring said copy paper above said mesh shaped development electrode in a manner that the front surface of said copy paper, on which said electrostatic latent image is formed, makes contact with or is positioned in close proximity to said mesh shaped development electrode.

4,294,193

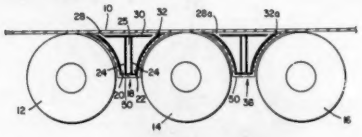
APPARATUS FOR VAPOR COATING A MOVING GLASS SUBSTRATE

Roy G. Gordon, 22 Highland St., Cambridge, Mass. 02138

Division of Ser. No. 884,432, Mar. 8, 1978, Pat. No. 4,206,252, which is a continuation-in-part of Ser. No. 784,542, Apr. 4, 1977, Pat. No. 4,187,336. This application Dec. 14, 1979, Ser. No. 103,519

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—718 **6 Claims**



1. In an apparatus for forming a continuous coating of progressively changing composition on heated glass over the length of a processing path through which said glass passes said apparatus comprising, in addition to means to support said glass and means to move it continuously along said processing path,

the improvement wherein there is provided a reaction zone the interior surfaces of which are formed primarily by said moving glass and a heat-transfer-medium moderated, temperature-controlled wall opposed to said glass said zone having, at one end thereof, a part means at a first station to introduce and distribute a gaseous reaction mixture comprising reactants which form reaction products that deposit on said glass at different rates, a gas flow path within said reaction zone wherein said gaseous reaction mixture flows along said glass surface, and said temperature controlled wall to port means at a second station at the opposite end of said zone to remove residual gaseous reaction mixture, wherein

said second station being relatively positioned along said reaction zone with respect to said first station that said heated glass wall of said reaction zone forms means to provide sufficient energy to said gaseous reaction mixture to achieve a substantial difference in composition deposited on said glass between the reaction gas mixture composition, as it passes between said first station and second station and wherein said temperature-controlled wall is maintained at a temperature low enough to avoid deposits of reaction products thereon.

4,294,194

DEVICE FOR COATING OBJECTS

Reinhard Behn; Hermann Heywang, both of Munich, and Horst Pachonik, Unterhaching, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 31, 1979, Ser. No. 89,857

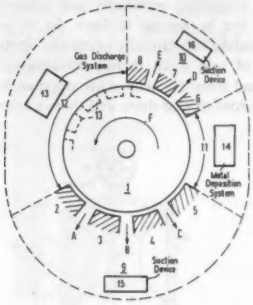
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848480

Int. Cl.³ C23C *13/00*

U.S. Cl. 118—719 **8 Claims**

1. A device for coating carriers with alternating different coatings in a different vacuum, comprising: at least first and

second vacuum chambers separated from one another by first and second vacuum air locks; transport means for transporting the carriers to be coated in only one moving direction from the first air lock through the first vacuum chamber to the second air lock and back towards the first air lock through the second vacuum chamber; means for coating the carriers arranged on the transport means in each of the vacuum chambers; each of



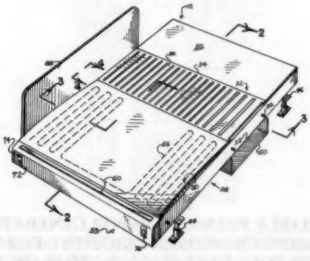
the air locks having jaws arranged directly adjacent the transport means and which form a relatively narrow gap therewith; suction means for drawing off residual gas between jaws of each of the air locks; and the first air lock, located in front of the first vacuum chamber in the direction of movement, having a lower residual gas pressure and having longer diffusion paths than the second air lock following the first vacuum chamber in the direction of movement.

4,294,195

HOG FARROWING MODULE

Joseph H. Rodenberg, 8290 N. Kenwood, Indianapolis, Ind. 46260, and Richard K. Gilcrest, 5613 Skyridge Dr., Indianapolis, Ind. 46250

Continuation of Ser. No. 801,625, May 31, 1977, abandoned. This application Jun. 4, 1979, Ser. No. 45,507
Int. Cl.³ A01K *1/00*
U.S. Cl. 119—20 **1 Claim**



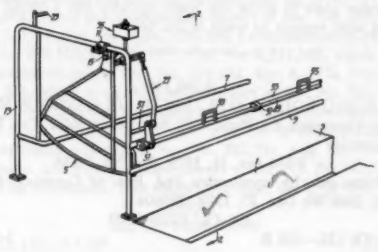
1. A modular base comprising:
a floor serving as a top for said base;
said floor having an opening toward one end thereof extending completely across the width thereof;
manure passing grate means retained by said base for covering said opening;
trough means connected to said base and disposed under said grate means for receiving waste disposed therethrough;
drinking water drain means attached to said base at the end thereof away from said opening, said drain means being connected to a tube running under said floor, with said tube emptying into said trough means;
heating means embedded in said floor and maintaining a desired floor temperature;
said floor having a crown profile formed therein as viewed in side elevation, with said crown formed between said trough means and said drain means, said crown extending laterally throughout the entire width of said floor; and
a plurality of screw jacks attached to said base for tilting said base at a desired slope of said trough means, and wherein said modular base is moveable as a unit and locateable on any flat surface by means of said screw jacks.

4,294,196

GATE ASSEMBLY

Owen M. Larsen, Box 68, Mitta Roadside, Tallangatta, Victoria 3700, Australia

Filed Feb. 14, 1980, Ser. No. 121,556
Claims priority, application Australia, Feb. 15, 1979, PD7702
Int. Cl.³ A01K *1/00*
U.S. Cl. 119—27 **5 Claims**



1. A gate assembly for a milking parlor or like animal enclosure including,
a barrier pivotally mounted about a substantially horizontal elevated axis from a support for movement between an open position in which it allows exit of an animal from the enclosure, and a closed position in which it prevents such exit,
operating means for said barrier and a lever arrangement connecting said operating means to the barrier providing locking means tending to hold the barrier open against the action of gravity.
said locking means providing a past dead centre locking action,
said lever arrangement including an extension arm on said barrier,
an angled arm pivotally attached to the extension arm,
a bell crank arm pivotally connected to the angled arm and to a rotatable shaft attached to said support, and
said operating means connected to said rotatable shaft for rotating the shaft and said crank arm for opening and closing said barrier.

4,294,197

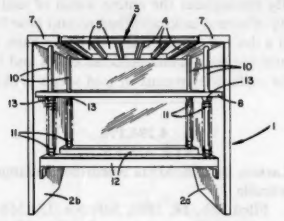
HAYBOX

Cornelis Snel, Atlasdreef 53, 3561 Ac Utrecht, and Albert Kuus, Korhoenlaan 41, 3721 Eb Bilthoven, both of Netherlands

Filed Jul. 9, 1979, Ser. No. 55,959
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—60 **13 Claims**

1. Haybox for the feeding of horses comprising interconnected walls defining a box, a rack positioned on an upper part of the box, and a movable plate forming a bottom of the box and being movable between lowered and raised positions within said box for supporting hay, guide bars extending within said box parallel to said wall, said movable plate being provided with at least two spaced apart perforations through which said guide bars extend, pressure springs fitted on said guide bars on the underside of the movable plate for exerting

upwards pressure, spherical type means positioned at least in part between said springs and said movable plate for transferring spring force to said movable plate, said spherical type means having a larger diameter than that of the perforations,



the diameter of the guide bars extending through the movable plate being smaller than the diameter of the perforations in the movable plate to allow the latter to carry out a tilting movement with respect to walls of the box.

4,294,198

HEATING BOILER FOR LIQUID OR GASEOUS FUELS

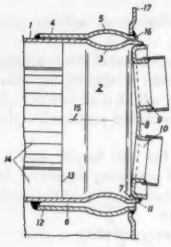
Hans Viessmann, Im Hain, 3559 Battenberg, Eder, Fed. Rep. of Germany

Filed Jan. 31, 1979, Ser. No. 7,886

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804780; Dec. 27, 1978, 2856061

Int. Cl.³ F22B *7/00*

U.S. Cl. 122—136 R **3 Claims**



1. A heating boiler comprising a water jacket including front and rear walls, fuel flues, tube and sleeve means, said tube means extending through said walls and enclosing said flues and defining a combustion chamber and a collecting chamber, one of said means, in the vicinity of said collecting chamber, encircling the other of said means and defining an annular gap therewith, at least one of said means having a bulge adjacent said gap to increase the size of the gap between said means, and closure means on one of the first said means to obturate said collecting chamber, said rear wall having a thermally conductive connection with said one means which encircles said other means.

4,294,199

STEAM GENERATING MAGNETOHYDRODYNAMIC DIFFUSER

Scott L. Darling, Tariffville, and Carl R. Bozzuto, Enfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 26, 1979, Ser. No. 88,731

Int. Cl.³ F22B *21/30*

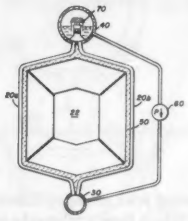
U.S. Cl. 122—276 **1 Claim**

1. A steam generating diffuser comprising:

a. a horizontally orientated, longitudinally elongated upper collection header;

b. a horizontally orientated, longitudinally elongated lower distribution header positioned beneath said upper header;

c. a plurality of heat exchange tube pairs disposed side by side in vertical planes to form an open-ended divergent duct disposed about a vertical axis, the tubes of each pair extending vertically upward from said lower header, thence diverging by extending outwardly and upwardly at an acute angie with the horizontal to form the floor of said duct, thence extending substantially vertically upward to form the side walls of said duct, thence converging by extending upwardly and inwardly at an acute angle with the horizontal to form the roof of said duct, and thence extending substantially vertically upward to said upper header, each tube thereby providing a continuously upwardly directed fluid flowpath between said lower and said upper headers;



d. a refractory lining laid up around the inner surface of said divergent duct so as to protect the heat exchange tubes forming said divergent duct from hot gases passing therethrough;

e. means for circulating water from said lower header through the heat exchange tubes forming said duct to said upper header whereby a portion of the water is vaporized to steam when passing through said heat exchange tubes; and

f said upper collection header further comprises a water and steam drum having internal means for separating the steam from the water collecting therein.

4,294,200

VARIABLE PRESSURE VAPOR GENERATOR UTILIZING CROSSOVER CIRCUITRY FOR THE FURNACE BOUNDARY WALL FLUID FLOW TUBES

Walter P. Gorzegno, Morristown, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

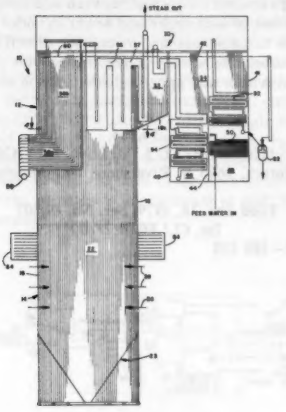
Filed Dec. 6, 1979, Ser. No. 100,770

Int. Cl.³ F22B *27/04*

U.S. Cl. 122—406 S **6 Claims**

1. A vapor generator comprising an enclosure defined in part by a front wall, a rear wall and two sidewalls, each of said walls comprising a plurality of interconnected tubes; burner means associated with either said front wall, said rear wall or both; each of said sidewalls having a plurality of sections; means for passing fluid initially through the entire length of at least one of said sidewall sections and then through said front wall, said rear wall and the other sidewall sections; and cross-

over means associated with said front wall, said rear wall and said other sidewall sections for transferring said fluid from one



area of said front wall, said rear wall and said other sidewall sections to another area thereof.

4,294,201

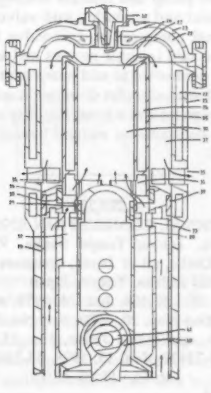
INTERNAL COMBUSTION ENGINES

Robert V. Swartz, 2528 Westford Way, Mountain View, Calif. 94040

Filed Feb. 5, 1979, Ser. No. 9,490

Int. Cl.³ F02B *33/04*; F01L *11/00*; F02B *25/12*

U.S. Cl. 123—73 R **3 Claims**



1. An internal combustion engine of the character described comprising in combination a cylinder having adjoined at opposite ends a cylinder-head and a crankcase, a piston reciprocable in said cylinder, a scavenging-pump formed by cooperation of said piston and said crankcase, an annular recess in the head of said piston, the portion of the piston-head surrounded by said recess being referred to as a plunger, a stationary concentric sleeve suspended from said cylinder-head with transverse gas-passage-means interposed between said sleeve and said cylinder-head, a plain working-chamber formed by cooperation of said plunger with the internal cylindrical surface of said sleeve, said sleeve having a sliding fit in said recess, an annular working-chamber formed by cooperation of said piston with said cylinder and the external cylindrical surface of said sleeve, exhaust-porting in said cylinder adapted to be uncovered by said piston completing its power-stroke toward said crankcase, transfer-porting in outer wall of said recess adapted to be uncovered by the outer surface of said sleeve as said piston completes its power-stroke, whereby said recess is placed in communication with said crankcase, transfer-porting in said sleeve adapted to be uncovered by said plunger as said piston completes its power-stroke, whereby said recess communicates with said plain working-chamber, the arrangement being such that when said piston ends its power-stroke a scavenging-path is established from said crankcase into said recess, thence through said plain working-chamber, thence in various radially-outward directions through said transverse gas-passage-means, thence through said annular working-chamber to said exhaust-porting.

4,294,202

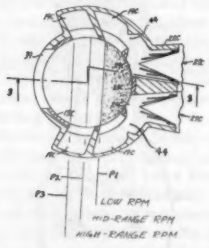
FUEL PORTING FOR TWO CYCLE INTERNAL COMBUSTION ENGINE

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Continuation-in-part of Ser. No. 941,596, Sep. 12, 1978, Pat. No. 4,202,298, which is a continuation-in-part of Ser. No. 859,476, Dec. 12, 1977, Pat. No. 4,143,626, and a continuation-in-part of Ser. No. 839,180, Oct. 4, 1977, Pat. No. 4,161,163, which is a continuation-in-part of Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, which is a continuation-in-part of Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and a continuation-in-part of Ser. No. 361,407, May 18, 1973, abandoned. This application Mar. 24, 1980, Ser. No. 133,098

Int. Cl.³ F02B *33/04*

U.S. Cl. 123—73 PP **7 Claims**



5. A variable speed, two-cycle, internal combustion engine comprising a crankcase and a cylinder having a combustion chamber, a piston working in the cylinder, a fuel chamber below the piston, port means providing communication with said fuel chamber, an intake tract in fluid communication with said port means, reed valve means disposed in the intake tract for controlling the flow of fluid through the intake tract, at least two transfer ports communicating with the combustion chamber above the piston when the piston is in bottom dead center position, transfer passages formed in the cylinder and respectively communicating with the transfer ports and with said fuel chamber for conveying fluid from the fuel chamber to the transfer ports, and fuel flow passage means interconnecting the transfer passages in a region above the piston when the piston is in bottom dead center position.

7. A variable speed, two-cycle crankcase compression, internal combustion engine, comprising: engine housing structure including a cylinder and a crankcase, a piston mounted for reciprocation in the cylinder between top and bottom dead center positions, a fuel intake chamber for receiving fuel from a supply source, reed valve means for controlling the flow of fluid through the intake chamber in a path directed substantially radially toward the bottom dead center position of the piston, and passage means formed in the engine housing struc-

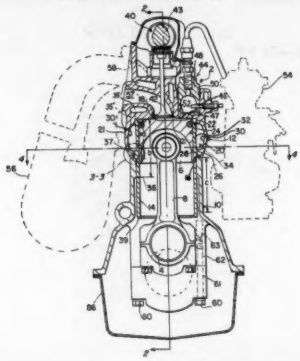
ture and communicating with the intake chamber downstream of the reed valve means, the passage means including porting in the engine housing structure at least a part of which is in the cylinder wall in the bottom dead center position of the piston and provides for substantially direct flow of fuel substantially radially of the cylinder from the reed valve means into the space below the level of the lower edge of the piston at the side presented toward the porting when the piston rises substantially above the bottom dead center position, said porting being dimensioned and positioned axially of the cylinder so that a substantial part thereof extends below the level of the lower edge of the piston at the side presented toward the porting when the piston is in bottom dead center position and so that a substantial part of said porting is open to the crankcase throughout the stroke of the piston, and the passage means further including at least one portion communicating with the fuel intake chamber throughout the piston stroke and having porting through the cylinder wall above the piston in bottom dead center position and being extended through the housing structure and opening into the crankcase below the piston throughout the piston stroke.

4,294,203

INTERNAL COMBUSTION ENGINE WITH INTEGRAL UPPER CYLINDER SECTION AND HEAD

Philip E. Jones, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sep. 10, 1979, Ser. No. 74,065
Int. Cl.³ F02F *7/00, 1/10;* **F02B** *75/18*
U.S. Cl. 123—195 R **21 Claims**



14. In an internal combustion engine having a crankshaft, at least one reciprocating piston connected with the crankshaft and a cylinder cavity within which the reciprocating piston moves between upper and lower limits of travel, the combination comprising

(a) an integral head and upper cylinder section assembly containing a recess shaped to form a first portion of the cylinder cavity, said upper assembly being formed of cast iron;

(b) an integral crankcase and lower cylinder section assembly containing the remaining portion of the cylinder cavity, said lower assembly being formed of metallic material distinct from cast iron;

(c) connection means for connecting said upper and lower assemblies along a joinder zone;

(d) liner means disposed within said cylinder cavity portions for guiding the reciprocating movement of the piston within the cylinder cavity, said liner means including an exterior surface spaced from the interior surface of said upper assembly recess to form a coolant cavity shaped to bring coolant into direct contact with no more than 40 percent of the total axial length of said liner means;

(e) combustion gas seal means for sealing the upper end portion of said liner means to form a combustion chamber; and

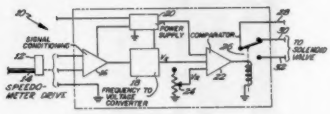
(f) coolant seal means disposed adjacent said joinder zone for forming a coolant cavity seal between said liner means and at least one of said upper and lower cylinder section assemblies to cause coolant to contact directly said liner means substantially only along the portion of the liner received within said upper cylinder section assembly.

4,294,204

VEHICLE SPEED LIMITING DEVICE

Erwin E. Hurner, 2605 S. Rivershore Dr., Moorhead, Minn. 56560

Filed Jun. 18, 1979, Ser. No. 49,307
Int. Cl.³ F02B *77/00*
U.S. Cl. 123—198 DB **5 Claims**



1. A Vehicle Speed Limiting Device for use with diesel vehicles having fuel injection systems, said speed limiting device comprising:

means for measuring the speed of said vehicle;

means for comparing the output of said vehicle speed measuring means to a predetermined speed; and

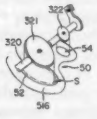
means responsive to said comparing means for interrupting of fuel flow through said injection system when said vehicle speed exceeds said predetermined speed, said interrupting means comprising a valve having an inlet and selectable first and second outlets, said injection system having a fuel pump and injector nozzles, said fuel pump having an inlet and an outlet, said valve inlet being connected to said pump outlet, said valve first outlet being connected to said injector nozzles and said valve second outlet being connected to said pump inlet and said injector nozzles, said second outlet directing a minimal amount of fuel to said nozzles and a great majority of the fuel to said pump inlet, said minimal amount having a pressure of at least 18 p.s.i.

4,294,205

INTERNAL COMBUSTION ENGINE

Masahiko Iiyama, Tokyo; Tsugio Sanka, Wako, and Kenji Naito, Kamifukuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 48,468, Jun. 14, 1979, abandoned. This application Nov. 20, 1980, Ser. No. 208,841
Claims priority, application Japan, Jun. 15, 1978, 53-72421; Jun. 15, 1978, 53-72422; Jun. 15, 1978, 53-72424
Int. Cl.³ F02B *19/10*
U.S. Cl. 123—274 **7 Claims**



1. In a multi-cylinder internal combustion engine having, for each cylinder provided with a reciprocal piston therein, a main combustion chamber defined above the piston and a sub-com-

bustion chamber defined above said main combustion chamber and communicating with the latter through a torch nozzle, a carburetor having a main intake passage and a sub-intake passage for supplying a comparatively lean mixture and a comparatively rich mixture to said main and sub-combustion chambers, respectively, said carburetor comprising a single throttle valve shaft extending across said main and sub-intake passages, a main throttle valve and a sub-throttle valve disposed in said main and sub-intake passages, respectively, said main and sub-throttle valves being attached to said single throttle valve shaft, one of said main and sub-throttle valves having an outside diameter smaller than the inside diameter of the associated intake passage so that the ratio of the open areas of said main and sub-intake passages is not constant as said throttle valve shaft is operated.

4,294,206

COMBUSTION METHOD AND DEVICE FOR PRACTICING SAME

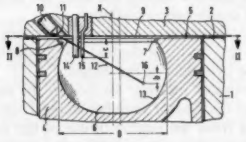
Alfred Urlaub, and Franz Chmela, both of Nuremberg, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Continuation of Ser. No. 779,754, Mar. 21, 1977, abandoned. This application Jul. 9, 1979, Ser. No. 55,761

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611624

Int. Cl.³ F02B *19/08, 19/16*

U.S. Cl. 123—276 **8 Claims**



1. An air compressing internal combustion engine having ignition means which includes in combination: a cylinder, a cylinder head sealingly connected to said cylinder, a piston reciprocably arranged in said cylinder and provided with a combustion chamber open toward said cylinder head with the inner contour of said combustion chamber being that of a body of revolution, injection nozzle means arranged in said cylinder head and having a nozzle opening directed toward said combustion chamber so that the major portion of the fuel jet injected by said injection nozzle hits the wall of said combustion chamber, and ignition means so arranged in the region of said injection nozzle that at the top dead center position of said piston said ignition means extend into said combustion chamber near said injection nozzle opening both between the pass of the fuel jet ignited already when injected through said nozzle into said combustion chamber on one hand and then said combustion chamber wall on the other hand, the area of impingement of the fuel jet on the combustion chamber wall being located in the lower section of said combustion chamber, the combustion chamber being formed as a spherical combusion chamber having a flattened bottom and a constricted throat.

4,294,207

EXTERNALLY IGNITED, FOUR-CYCLE, PISTON-TYPE INTERNAL COMBUSTION ENGINE

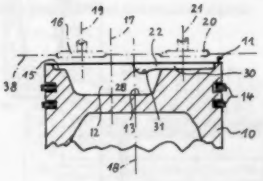
Michael G. May, Bel Air, Ch-1180 Rolle, Switzerland

Filed Apr. 25, 1980, Ser. No. 143,586

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1979, 2934644

Int. Cl.³ F02B *3/00, 23/00*

U.S. Cl. 123—279 **34 Claims**



1. An externally ignited, four-cycle internal combustion engine comprising a gas supply channel having an inlet valve, at least one cylinder having a head, a piston in said cylinder having a top defining with said cylinder a combustion chamber, overhead gas exchange valves having plates provided with end faces, said piston top being provided with a depression having a guide groove provided with a mouth communicating therewith, vortex producing means including a circumferential wall with said mouth in which a vortex flow of gas and air mixture to be combusted is generated rotating in a path approximately parallel to said piston top, the volume of said combustion chamber available in the top dead center position of said piston is primarily embodied by said depression in said piston top, the central longitudinal axis of said depression being provided at a distance from the longitudinal axis of said piston approximately parallel to it, the central longitudinally axis of said depression being disposed at a location between the vicinity of a connecting line of the centers of the end faces on the combustion chamber side of said valve plates within a distance from this connecting line of less than 10% of the diameter of said piston and said longitudinal axis of said depression being at a smaller or no distance from the center of one valve front face than from the center of the other valve front face, one valve front face being located at least substantially above and respectively opposite said depressions, an indentation being provided in said piston top opposite said other valve plate, said indentation having at least the diameter of said valve plate and into which the valve plate protrudes in the top dead center position of said piston, and said indentation in the top of the piston and in the cylinder head including said other valve plate being extended toward a broad and flat guide groove leading approximately tangentially into said depression of said piston, so that the vortex flow rotating in a path approximately parallel to said piston top about the central longitudinal axis of said depression is be effected by means of the gas and air mixture flowing out of said guide groove into said depression toward the end of the compression stroke, and that the average depth of said guide groove at its discharge point is substantially smaller than the depth of said depression.

4,294,208

ATOMIZING SHOCK WAVE PRECOMBUSTOR

William R. Wagner, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 31, 1980, Ser. No. 135,389

Int. Cl.³ F02B *19/14*

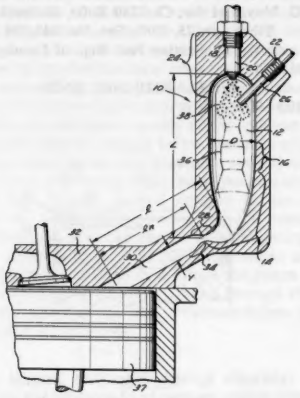
U.S. Cl. 123—285 **14 Claims**

1. A precombustor for use in diesel engines, comprising:

a precombustion chamber;

a fuel spray nozzle port through which a fuel spray nozzle may be incorporated into said precombustion chamber;

a port for an ignition means adjacent to said spray nozzle port; and



a supersonic DeLaval nozzle integrally incorporated into said precombustion chamber opposite said spray nozzle, for enhancing the injection of air into said precombustion chamber.

4,294,209

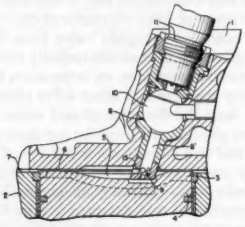
INTERNAL COMBUSTION ENGINE

Erwin Eisele, Stuttgart; Hans-Peter Charzinski, Waiblingen, and Klaus Binder, Deizisau, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 901,772, Aug. 18, 1976, abandoned, which is a continuation of Ser. No. 715,540, Aug. 18, 1976, abandoned. This application Apr. 16, 1979, Ser. No. 30,545

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—293 **10 Claims**



1. An internal combustion engine comprising a plurality of pistons disposed in cylinders, a cylinder head, a main combustion space means, recess means provided in the respective pistons for forming at least a part of the main combustion space means, an auxiliary chamber means eccentrically provided in the cylinder head, and an injection nozzle means operatively associated with the auxiliary chamber means, several discharge openings provided in said auxiliary chamber means for discharging into the main combustion space means, the direction and cross section of the discharge openings being matched to a main combustion space-air volume component of a main combustion space-air volume to be impinged upon by a jet passing through the respective discharge openings, characterized in that the discharge openings have a cross section which is substantially proportional to the main combustion space-air volume component of the main combustion space-air volume disposed in front of and impinged upon by a jet passing through the respective discharge openings when the piston is at a position having a crankshaft angle corresponding to a center point of an area under a full-load heat-release curve for the combustion process, and in that the discharge openings are substantially directed toward a center of gravity of the respective main combustion space-air volume component of the main combustion space-air volume.

4,294,210

DISTRIBUTOR-TYPE INJECTOR PUMP, FOR MULTI-CYLINDER COMPRESSION-IGNITION INTERNAL COMBUSTION ENGINES

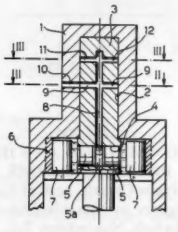
Cesare Bassoli; Giorgio Cornetti, and Francesco Lovisolo, all of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Feb. 6, 1979, Ser. No. 9,619

Claims priority, application Italy, Feb. 15, 1978, 67315 A/78

Int. Cl.³ F02M *45/02*

U.S. Cl. 123—300 **1 Claim**



1. A fuel injection pump for a multi-cylinder compression-ignition internal combustion engine of the direct-injection type, said pump comprising:

a pump body having an internal cylindrical cavity and a compression chamber,

means for the introduction of fuel in the said compression chamber,

piston means slidable within the body for compressing fuel in the said compression chamber,

means defining a number of delivery apertures in the wall of the cylindrical cavity of the body for communication with each of the cylinders of the engine,

a rotary distributor member located in the said cylindrical cavity, said distributor member being rotatable by drive transmitted from the engine in use of the pump to effect one complete revolution in said cavity in each cycle of the engine,

two distinct fuel passage means, formed in said rotary distributor member and each having an inlet end permanently communicating with the compression chamber and an outlet end in the external surface of the distributor member, the outlet ends of the said passage means being situated in two areas angularly separated from each other such that they come intermittently into communication, upon rotation of the distributor member, with successive said apertures to effect, in correspondence with each fuel delivery stroke of the said piston means, two injections of fuel into two different cylinders of the engine, so that the pump delivers to each cylinder of the engine in each cycle thereof a principal injection of fuel substantially at the end of the compression stroke in said cylinder, preceded by a pre-injection of fuel,

means sensitive to the engine rotational speed for advancing the start of the delivery stroke of the piston means upon increase in the engine rotational speed, wherein the angle between the outlet ends of the said two fuel passage means is such that when the engine rotational speed is lower than a threshold value substantially equal to half the maximum speed of rotation of the engine, only one of said two fuel passage means communicates with one of said delivery

apertures during each fuel delivery stroke of said piston means, whereby only the principal injection is delivered to each cylinder of the engine in each cycle thereof when the rotational speed of the engine is lower than said threshold value.

4,294,211

METHOD AND APPARATUS FOR CORRECTING THE FUEL QUANTITY IN AN INTERNAL COMBUSTION ENGINE

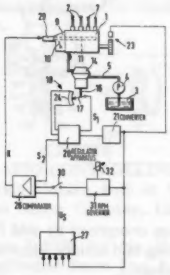
Gerhard Stumpp, Stuttgart, and Wolf Wessel, Oberriexingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 14,197

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807924

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—379 **22 Claims**



1. A method for the correction of a fuel quantity apportioned to an internal combustion engine in accordance with the deviation of the same from a desired value having a fuel injection apparatus which has a control device having an apparatus for the arbitrary and/or regulatable adjustment of the fuel injection quantity per injection step characterized by the steps of measuring the fuel quantity delivered per unit of time to the fuel injection apparatus as a first control value, converting said first control value with consideration of the rpm into a second control value in accordance with the quantity of fuel injected per injection step, comparing said second control value with a desired value which is variable in accordance with at least one operational parameter, and generating a correction value in accordance with the deviation of said second control value from the desired value for the purpose of adjusting the control device of the injection apparatus.

4,294,212

AIR-FUEL RATIO CONTROL METHOD AND APPARATUS OF AN INTERNAL COMBUSTION ENGINE

Kenji Aoki, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 11, 1978, Ser. No. 895,524

Claims priority, application Japan, Sep. 12, 1977, 52-108889

Int. Cl.³ F01N *3/15*

U.S. Cl. 123—440 **9 Claims**

1. An air-fuel ratio control method for adjusting the amount of fuel permitted to flow into an internal combustion engine in accordance with engine condition signals comprising the steps of:

detecting engine operating conditions;

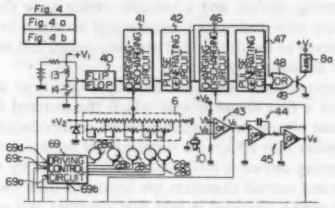
generating said engine condition signals from said detected engine operating conditions, said engine condition signals being related to said detected engine operating conditions in accordance with predetermined functional relationships;

adjusting the amount of fuel permitted to flow into said engine in accordance with said engine condition signals;

sensing the concentration of a predetermined exhaust gas component in the exhaust gas of said engine and generating a detected component concentration signal;

producing an air-fuel ratio correction signal by integrating said detected component concentration signal with respect to time;

compensating the adjusted amount of fuel permitted to flow into said engine by said engine condition signals in accordance with said air-fuel correction signal;



generating a signal corresponding to a mean value of said air-fuel ratio correction signal;

adjusting at least one of said functional relationships in accordance with said generated mean value signal; and,

repeating the above sequence of steps so that the said means value signal continuously approaches a predetermined value equivalent to the value of the air-fuel ratio correction signal when the compensated amount of fuel supplied in accordance with the air-fuel ratio correction signal becomes zero.

4,294,213

FUEL SUPPLYING DEVICE FOR USE IN FUEL INJECTION TYPE INTERNAL COMBUSTION ENGINE

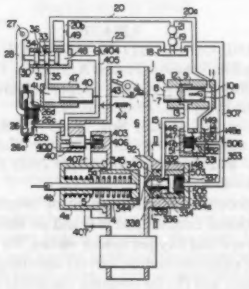
Masaharu Sumiyoshi; Setsuro Sekiya; Katsuhiko Motosugi, all of Toyota; Junzo Uozumi, Nagoya; Tsuneo Ando, Chiryu; Yuzo Takeuchi, and Mikio Minoura, both of Nagoya, all of Japan, assignors to Aisan Industry Co., Ltd., Ohbu and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 10, 1979, Ser. No. 56,310

Claims priority, application Japan, Nov. 30, 1978, 53-147148

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—454 **8 Claims**



1. In a fuel supplying device for a fuel injection type internal combustion engine, comprising:

(a) an air horn,

(b) a throttle valve disposed in said air horn,

(c) an air valve disposed in said air horn upstream of said throttle valve,

(d) a fuel metering device operatively connected to said air valve,

(e) fuel supplying means adapted to supply fuel at a predetermined fuel pressure to said fuel metering device,

(f) a fuel tank,

(g) an injector arranged to discharge the fuel metered by said fuel metering device into said air horn in the vicinity of said throttle valve, and

(h) a constant differential pressure valve arranged to maintain a predetermined differential pressure across said fuel metering device, and including a diaphragm type valve arranged to sense and amplify differential pressure across said fuel metering device, and a variable orifice type flow control device provided in said injector and arranged to operate in response to the differential pressure sensed and amplified by said diaphragm type valve,

the improvement wherein said diaphragm type valve comprises a first chamber into which the metered fuel downstream of said fuel metering device is introduced, a second chamber into which the supplied fuel upstream of said fuel metering device is introduced, a diaphragm by which said first and second chambers are separated from each other, a first spring disposed in said first chamber and arranged to bias said diaphragm toward said second chamber, and a nozzle disposed in said second chamber and provided at its end confronting said diaphragm with an introduction port and at its other end with a fuel relief port through which fuel returns to said fuel tank through a fixed orifice, while said variable orifice type flow control device comprises a metered fuel chamber into which the metered fuel is introduced, a pilot chamber into which the relieved fuel through said relief port upstream of said fixed orifice is introduced, a movable piston by which said chambers are separated from each other, a piston rod unitary with said movable piston, a second spring disposed in said metered fuel chamber and arranged to bias said movable piston toward said pilot chamber, a third spring disposed in said pilot chamber and arranged to bias said movable piston toward said metered fuel chamber, and a variable orifice actuated by said piston rod.

4,294,214

ENGINE COMBUSTION CONTROL SYSTEM

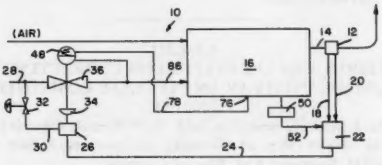
Edwin S. Treible, Ringoes; Joseph A. Dopkin, Hopewell, both of N.J., and Raymond N. Alford, Coopers Plains, N.Y., assignors to Ingersoll-Rand Co., Princeton, N.J.

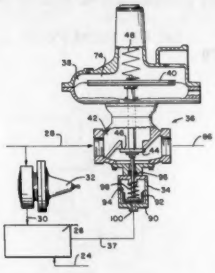
Division of Ser. No. 96,426, Nov. 21, 1979, Pat. No. 4,263,883. This application Oct. 20, 1980, Ser. No. 198,531

Int. Cl.[3] **F02B** *75/10, 3/02;* **F02D** *1/00;* **F16K** *17/34*

U.S. Cl. 123—458 **7 Claims**

1. An improved combustion control system for an engine having an exhaust conduit and fuel and air inlet lines, comprising temperature and oxygen sensor means, for interpositioning in the engine exhaust conduit, for: (a) admitting engine exhaust gases thereinto, and (b) for emitting electrical signals representative of or analogous to both engine exhaust temperatures and engine exhaust oxygen content; signal comparator/controller means, coupled to said sensor means, for emitting discrete, unitary electrical signals derivative of said temperature and oxygen-content signals; and fuel-regulating means, for interpositioning in said fuel inlet line, coupled to said comparator/controller means and responsive to said discrete, unitary signals for regulating fuel conduct through said fuel inlet line; wherein the improvement comprises:





transducer means comprised by said fuel regulating means for transforming said unitary, electrical signals into analogous fluid pressures.

4,294,215

FUEL INJECTION SYSTEM

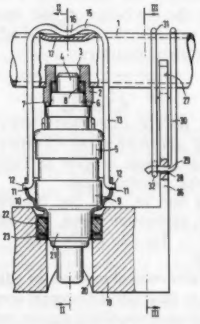
Waldmar Hans, Bamberg; Rudolf Sauer, Renningen; Otto Glöckler, Benningen; Ulrich Steinbrenner, Stuttgart; Dieter Günther, Murr, and Manfred Lembke, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 31, 1979, Ser. No. 62,598

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908095

Int. Cl.[3] **F02M** *55/02;* **B05B** *1/14*

U.S. Cl. 123—470 **10 Claims**



1. A fuel injection system for internal combustion engines including a common fuel distributor line in which:

said common distributor line includes a plurality of apertures therein;

a plurality of sockets one each inserted in each of said apertures in said distributor line;

a plurality of injection valves each including a body portion, an input end and an output end;

said inlet end of each valve inserted into one each of said sockets;

means between said injection input end of each of said valves and said sockets for sealing against leakage of fuel;

said output end of each of said injection valves forming a nozzle element which can be sealably inserted into an appropriate opening correlated with an opening in an intake pipe of an internal combustion engine;

separate support means, each separate support means supported by said body of one each of said injection valves;

a support bracket member supported by each of said support means including a portion extending from said support means to said fuel distributor line, and

each of said bracket portions extending to said distributor line includes grasping means for grasping said distributor line;

whereby each of said injection valves are secured to said fuel distributor line in a tight leak-free condition.

4,294,216

AIR FUEL RATIO CONTROLLING DEVICE

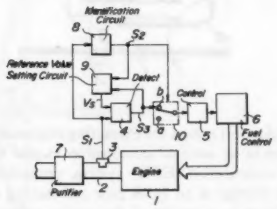
Toshimi Abo, and Akio Hosaka, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 7, 1979, Ser. No. 101,551

Claims priority, application Japan, Dec. 8, 1978, 53-151011

Int. Cl.³ F02B *3/08;* **F02M** *7/12*

U.S. Cl. 123—489 **3 Claims**



1. An air fuel ratio controlling device comprising an exhaust gas sensor for detecting composition and concentration of exhaust gas of an engine, and a means for delivering a deviation signal based on a deviation between an output of said exhaust gas sensor and a reference value, the air fuel ratio of mixed gas to be supplied to the engine is feedback controlled by a control signal based on said deviation signal and the reference value is varied to match with condition of the output of the exhaust gas sensor, an improvement lies in that the device comprising a means for switching outer supply current to the exhaust gas sensor when an output voltage of the exhaust gas sensor during supply of a current of a first predetermined value becomes less than a certain predetermined value to a second predetermined value smaller than said first predetermined value and for starting feedback control from such time, and a means for previously setting an intermediate value lying between an expected value V''_x of the output voltage of the exhaust gas sensor when the mixed gas is too rich and an expected value V''_y of the same is too lean at a time of switching from said first predetermined value to said second predetermined value under the situation of too rich or too lean mixed gas and applying said intermediate value as an initial value of said reference value.

4,294,217

ELECTRICALLY CONTROLLED FUEL INJECTION APPARATUS

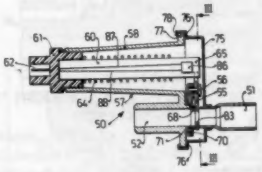
Otto Glöckler, Renningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 966,232, Dec. 4, 1978, abandoned. This application Sep. 21, 1980, Ser. No. 196,501

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 2803266

Int. Cl.³ F02M *23/10*

U.S. Cl. 123—491 **9 Claims**



1. An electrically controlled fuel injection apparatus for internal combustion engines comprising at least one electromagnetic injection valve which is controlled by an electronic control apparatus, a throttle valve in an intake manifold, one supplementary air valve disposed laterally within a housing and arranged to supply supplemental air so that the supplemental air bypasses said throttle valve in the intake manifold, said supplementary air valve having a movable valve member actuatable against a return force, an actuating means operating in dependence on temperature for actuating said movable valve member, an electrical heating device attached to at least a portion of said actuating means operating in dependence on temperature and capable of being switched ON in the presence of ignition impulses, a temperature-sensitive element secured on said actuating means within the supplementary air valve housing responsive to prevailing temperature within said supplementary air valve housing and the temperature of said actuating means and connected electrically with the electronic control apparatus to influence the fuel injection quantity.

4,294,218

DIFFERENTIAL TIMING ALTERING MECHANISM FOR FUEL INJECTORS

Dennis M. King, Peoria Heights, and Ronald D. Richardson, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 26, 1978, Ser. No. 955,082

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—502 **2 Claims**

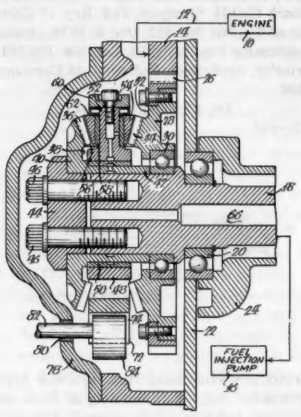
1. A power plant comprising:

an internal combustion engine having a rotary output;

a fuel injection pump having a rotary input adapted to be driven by said rotary output in timed relation thereto;

means interconnecting said input and output comprising first and second bevel gears mounted, in spaced relation, for rotation about a common axis, the facing sides of said bevel gears having facing teeth in aligned relationship, one of said bevel gears being connected to said input and the other of said bevel gears being connected to said output, at least one pinion gear disposed in the space between said bevel gears and having teeth in engagement with the teeth of both said bevel gears, a carrier disposed between said bevel gears and mounted for rotation about said common axis, said carrier further journalling said pinion gear for rotation about an axis between said bevel gears and extending generally radially of said common axis, and selectively operable means connected to said carrier for bidirectionally moving the same to shift said third gear to selectively alter the phasing between said engine and said fuel pump; and

said selectively operable means including a shaft mounted for rotation about a fixed axis spaced from, but generally parallel to said common axis, an eccentric mounted on said



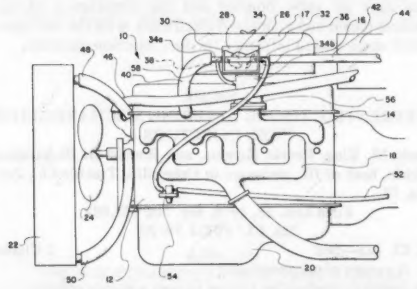
shaft, a pair of spaced surfaces on said carrier partially surrounding said eccentric, and a motor affixed to said shaft to rotate the same.

4,294,219

FUEL HEATING SYSTEM FOR AN ENGINE

Bryant T. Rowe, P.O. Box 605, Louisburg, N.C. 27549

Filed Aug. 27, 1979, Ser. No. 70,017
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **1 Claim**



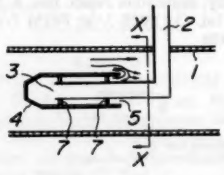
1. A device and system for improving the performance and fuel economy of an engine of the type having a radiator cooling system and a fuel pump for directing fuel to the carburetor, said device and system comprising: a generally elongated fuel chamber having a longitudinal axis and a pair of end walls and a connecting surrounding wall structure extending between said end walls that define a closed fuel chamber therein; fuel inlet port means formed off center in one end wall of said fuel chamber and communicatively connected to receive fuel being pumped by said fuel pump; fuel outlet port means formed off center in said other end wall of said fuel chamber and communicatively connected to a line leading to said carburetor for delivering fuel thereto and wherein said fuel inlet and outlet port means are disposed on opposite sides of said longitudinal axis of said fuel chamber; a heating line operatively connected to said radiator cooling system and extending generally centrally through said fuel chamber for heating fuel contained therein, said heating line including inlet and outlet ends formed generally centrally within opposite end walls of said fuel chamber in general parallel alignment with said fuel inlet and outlet means; said fuel inlet port means being formed in the same end wall of said fuel chamber as said outlet end of said heating line while said fuel outlet port means is formed in the opposite end wall of said fuel chamber generally adjacent said inlet end of said heating line; said inlet end of said heating line being operatively connected within said radiator cooling system to a hot water line leaving said engine such that fuel entering said fuel chamber enters the side thereof where hot water enters; and means for varying the resulting heated liquid-vapor state of fuel passing through said chamber and wherein said means for varying the resulting state of the fuel is provided for by the relative disposition of said heating line and said fuel inlet and outlet port means formed about the end walls of said fuel chamber in that by rotating said fuel chamber about said longitudinal axis of said fuel chamber and the axis of said heating line, said fuel outlet port means may be elevated with respect to said fuel inlet means and accordingly the liquid-vapor state of the existing fuel may be varied and adjusted accordingly.

4,294,220

INTAKE PORT MEANS FOR EXTRACTING ENGINE EXHAUST GAS FOR RECIRCULATION

Seishi Yasuhara, Yokosuka, and Eiichi Ohnishi, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 14, 1980, Ser. No. 111,555
Claims priority, application Japan, Jan. 17, 1979, 54/4411[U]
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—568 **10 Claims**



1. An intake port means for extracting engine exhaust gas for recirculation in an internal combustion engine having an exhaust gas recirculation (EGR) system, comprising an intake port means formed of an EGR pipe and having an extracting aperture placed in a stream of the engine exhaust gas, and a cover having a closed end lying on the upstream side of said aperture while having an open end facing the downstream side of said aperture in such a manner that the engine exhaust gas is extracted through trailing portion of the open end of the cover.

4,294,221

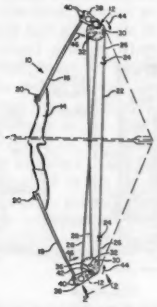
DEVICE FOR RETAINING A COMPOUND BOW IN A PARTIALLY DRAWN CONDITION

LeRoy J. Bryant, 2704 SE. 170th Ave., Portland, Oreg. 97236

Filed May 3, 1979, Ser. No. 15,062
Int. Cl.³ F41B *5/00*
U.S. Cl. 124—23 R **11 Claims**

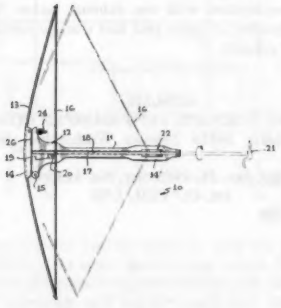
1. In a compound bow having a pair of flexible limbs and a pair of eccentric wheels, one of said pair of eccentric wheels being associated with each of said limbs, and the axes of rotation of the eccentric wheels being parallel to one another and extending transversely of the direction of flexure of said limbs, a pair of cables, each of said cables having an end and being wrapped around one of said eccentric wheels, attachment means connecting said end of each said cable to a respective end of a bowstring, and means for preventing slippage of each cable relative to the respective eccentric wheel around which it is wrapped, the improvement comprising:

(a) unidirectional motion-limiting and retention means interconnected with one of said eccentric wheels for allowing said one of said eccentric wheels to rotate substantially only in a first direction until it has rotated a predetermined angular distance in said first direction; and



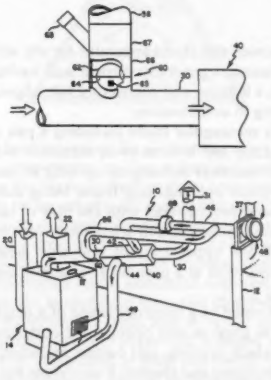
(b) release means for deactivating said retention means and allowing free rotation of said one of said eccentric wheels after it has rotated through said predetermined angular distance in said first direction.

4,294,222
PISTON TYPE CROSSBOW
Henry F. Pelsue, 8421 Foothill Blvd., Sunland, Calif. 91040
Filed Dec. 31, 1979, Ser. No. 108,636
Int. Cl.³ F41B 5/00
U.S. Cl. 124—25 **8 Claims**



1. A crossbow comprising:
an elongated stock having a pistol grip integrally formed on one end thereof;
a flexible bow carried on the opposite end of said stock from its end having said pistol grip;
hinge means interconnecting said bow at its mid-section to said stock so that said bow has a storage position lying parallel to the longitudinal axis of said stock and an operable position lying laterally across the longitudinal axis of said stock;
latch means releasably connecting said bow to said stock adapted to secure said bow to said stock in said operable position;
said bow having a string extending between the opposite ends of said bow;
a cocking mechanism carried on said stock operable to draw said string into a taut condition;
a trigger means operably carried on said stock for releasing said bow string;
said cocking mechanism includes a rotatable rod with respect to said stock having a catch selectively engagable with said bow string for drawing said bow string taut;
said cocking mechanism further includes said stock having a longitudinal slot rotatably carrying said rod;
a finger grip carried on the rear end of said rod with said catch carried on the opposite end thereof; and
a recess formed in said stock coextensive with said slot adapted to receive said catch when said rod is rotated so as to not interfere with said bow string during release of said bow string by said trigger mechanism.

4,294,223
BI-LOOP HEAT RECOVERY SYSTEM FOR AN OIL FIRED FURNACE
Albert Montague, 1689 Blue Jay Lane, Cherry Hill, N.J. 08003
Continuation-in-part of Ser. No. 7,412, Jan. 29, 1979, which is a continuation-in-part of Ser. No. 838,749, Oct. 3, 1977, abandoned. This application Sep. 4, 1979, Ser. No. 72,086
Int. Cl.³ F24H 3/00; F23L 3/00; F24B 7/00
U.S. Cl. 126—112 **5 Claims**



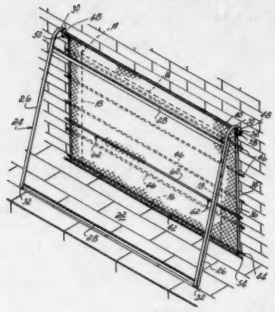
1. In a furnace located in an enclosure, the furnace having a burner, a blower coupled to the burner, an exhaust duct to convey products of combustion from the furnace to a stack, said exhaust duct having a barometric draft regulator, an improved system comprising:
(a) heat exchange means which can be quickly and easily coupled to the exhaust duct to provide a first zone to carry the products of combustion, and a second zone in heat flow communication with the first zone to carry a stream of air;
(b) first conduit means which can be quickly and easily coupled to provide gas flow communication between a point outside the enclosure and the second zone of said heat exchange means;
(c) second conduit means which can be quickly and easily coupled to provide gas flow communication between said point outside the enclosure and the barometric draft regulator; and
(d) third conduit means which can be quickly and easily coupled to provide gas flow communication between the second zone of said heat exchange means and the blower whereby air for combustion in the burner is supplied from said point outside the enclosure, and air is supplied to the barometric draft regulator from the same point outside the enclosure.

4,294,224

FIREPLACE SCREEN AND SHIELD ASSEMBLY

Walter C. Luther, Sr., Rte. 8, Box 267, Lake City, Fla. 32055

Filed Sep. 4, 1979, Ser. No. 72,123
Int. Cl.[3] F23L 5/02
U.S. Cl. 126—135 5 Claims



1. A fire screen and shield apparatus for use with a fireplace including a hearth, a generally vertical wall having an opening having a top, a bottom, and connecting side edges, said apparatus comprising in combination:

a generally rectangular frame including a pair of side members and top and bottom cross members interconnecting said side members defining an opening at least as large as said fireplace opening, said frame being adapted to lean against said vertical wall with the base of said side members resting on said hearth at a position removed from said wall and the upper ends of said side members resting against said wall at a position at or above said top of said opening,

a curtain formed of a fireproof fabric of a height and width at least as great as said opening for completely shielding said fireplace opening, said curtain including a transverse rod at the upper end thereof, a transverse rod at the lower end thereof, and a plurality of stiffening rods extending transversely of the curtain at spaced intervals therebetween, the opposite ends of said rods projecting laterally beyond the vertical side edges of said curtain,

a metal screen of a height and width at least as great as said fireplace opening for preventing sparks from being projected from said fireplace beyond said screen, said screen including a transverse support rod at the upper end thereof,

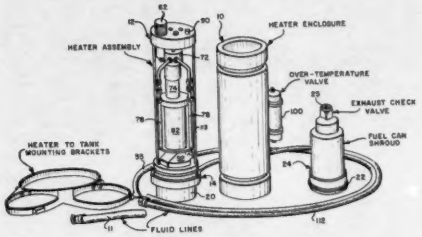
said frame including support means at the upper ends of said side members, said support means being adapted to receive the projecting ends of the top rod of said curtain to mount and support said curtain and to receive the projecting ends of said stiffening rods and said bottom rod such that said rods may be selectively disposed therein for selectively positioning the bottom rod and thereby the lower end of said curtain between a closed position wherein the bottom rod rests on the hearth, an open positon wherein the bottom rod and stiffening rods are received in said support means, and a draft position wherein said bottom rod is raised off said hearth for permitting draft along the fireplace floor and for preventing smoke from entering the room through the fireplace opening, and to receive said screen support rod to mount and support said screen at least when said curtain is in its open position.

4,294,225

DIVER HEATER SYSTEM

Kenneth E. Mayo, Nashua, N.H., assignor to Energy Systems Corporation, Nashua, N.H.

Filed May 22, 1979, Ser. No. 41,537
Int. Cl.[3] A61F 7/06
U.S. Cl. 126—204 6 Claims



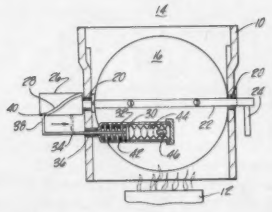
1. A heater for warming the body of a diver while under water comprising a housing, having a fluid inlet, a combustion chamber, means for supplying air and means for supplying fuel to said chamber of combustion therein, and means for exhausting the products of combustion, a fluid heat exchanger arranged in association with said combustion chamber, a pump for circulating fluid through said heat exchanger to be heated, electric motor means for operating said pump, and thermoelectric means mounted in association with said combustion chamber for converting a portion of said heat to electrical energy and means for passing said electrical energy to said motor to operate said pump, said pump having means for passing the heated fluid to the diver said means for supplying said fuel comprises a fuel storage canister removably securable to said housing in combination with the exhaust means from said combustion chamber to cause said fuel storage canister to be heated by said exhaust.

4,294,226

AUTOMATIC FURNACE VENT DAMPER CONTROL

Emanuel Feinberg, 24316 Martha Washington, Southfield, Mich. 48075

Filed Jan. 21, 1980, Ser. No. 113,992
Int. Cl.[3] F23L 3/00
U.S. Cl. 126—286 9 Claims



1. A temperature responsive damper system for use with a burner having a vent for combustion gases, comprising: a rotatable damper shaft supported in the vent to extend transversely across the vent; a planar damper fixed to the shaft so as to extend in a closed position transversely to the vent and block passage of air through the vent when the shaft is in a first rotational position and to extend in an open position parallel to the longitudinal axis of the vent to allow gas passage through the vent when the shaft is in a second rotational position; a fluid reservoir supported in the vent between the damper and the burner so that the reservoir experiences a temperature

which depends upon the state of operation of the burner; a fluid contained in the reservoir having a liquid state when the reservoir temperature is that obtained when the burner is not in operation and a gaseous state when the reservoir temperature is that obtained when the burner is in operation; a linear actuator supported for movement between a first position and a second position; a cam mechanism fixed to the damper shaft and connected to the linear actuator so that the damper is in an open position when said actuator is in a first position and the damper is in a closed position when the actuator is in the second position; and means for moving the actuator from its first position to the second position upon transition of the fluid within the reservoir from a liquid to a gas as a result of an increase in temperature in the reservoir resulting from the burner going into operation, and from its second position to its first position upon transition of the fluid from a gas to a liquid as a result of a decrease in the temperature of the reservoir resulting from the burner going out of operation; whereby said damper assumes its open position when the burner is in operation and its closed position when the burner is not in operation.

4,294,227

APPARATUS FOR HEATING WATER BY SOLAR HEAT

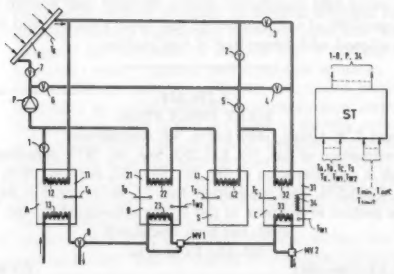
Ursula Kreibich, Riehen, and Rolf Schmid, Gelterkinden, both of Switzerland, assignors to CIBA-GEIGY Corporation, Ardsley, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,548

Claims priority, application Switzerland, Jun. 16, 1978, 6581/78; Aug. 29, 1978, 9114/78

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—400 **18 Claims**



1. Apparatus for heating water by solar energy, comprising a solar collector, a latent-heat storage means, first and second heat exchangers, and a service-water outlet side, the first exchanger operating at a lower temperature than the second, each of said heat exchangers comprising a container having a first heat exchange material therein, a first conduit passing through said container for conveying a second heat exchange material in indirect heat exchange with said first heat exchange material and a second conduit passing through said container conveying a third heat exchange material in indirect heat exchange with said first heat exchange material, storage means the second conduit of each heat exchanger being connected in series on the service water outlet side, means coupling the heat exchangers to the and collector to form three circuits, the first containing the collector and the first heat exchanger, the second containing the collector, the storage means and the second heat exchanger, and the third containing the storage means and the second heat exchanger, a circulating means in each circuit, and

a plurality of sensors to sense the temperature of the circulating medium in the collector, the operating temperatures of the two heat exchangers and the temperature of the storage means, and a control circuit responsive to said sensors to,

activiate the first circuit if the collector temperature is higher than the operating temperature of the first heat exchanger and lower than that of the second heat exchanger,

activate the second circuit if the collector temperature is higher than the operating temperature of the second heat exchanger, and

activate the third circuit if the collector temperature is lower than the operating temperature of the first heat exchanger and if the temperature of the storage means is simultaneously higher than the operating temperature of the second heat exchanger.

4,294,228

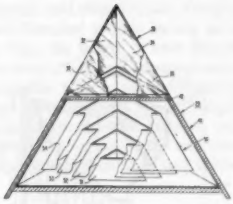
SOLAR HEATING AND SUBTERRANEAN COOLING

Robert Kruger, 412 N. Burnt Mill Rd., Ashland, N.J. 08003, and William J. Miller, Chalet Apartments, Tusc.-A, Pine Hill, N.J. 08021

Filed Nov. 9, 1978, Ser. No. 959,123

Int. Cl.³ F24J *3/02;* F24H *9/08;* E04B *1/74*

U.S. Cl. 126—430 **24 Claims**



1. A solar heating system for a structure comprising:

at least one transparent portion; at least one heat conducting chamber for heating a fluid medium contained within said chamber by means of solar energy admitted to said chamber through said transparent portion, said heat conducting chamber further comprising a plurality of heat conducting elements disposed within said chamber; and a fluid medium distribution means associated with said chamber for receiving the heated fluid from said chamber and distributing it to utilization areas, said structure and said transparent portion are both pyramidal in shape, said transparent portion comprising at least one corner of said structure, said transparent portion comprises the apex portion of said structure, said plurality of heat conducting elements comprises a plurality of different size heat conducting boxes disposed in a nesting array, each box having at least three side walls.

4,294,229

THERMOSIPHONING MODULE FOR ENVIRONMENTALLY DRIVEN HEATING AND COOLING SYSTEM

Timothy Maloney, Mountain Falls, Va., assignor to One Design, Inc., Mountain Falls, Va.

Continuation-in-part of Ser. No. 941,735, Sep. 12, 1978. This application Sep. 13, 1978, Ser. No. 942,133

Int. Cl.³ F24J *3/02;* F16K *31/18*

U.S. Cl. 126—434 **19 Claims**

1. A thermosiphoning module for an environmentally driven heating and cooling system utilizing a heat-transfer liquid, said module comprising:

a hollow body defining a liquid-tight interior space;

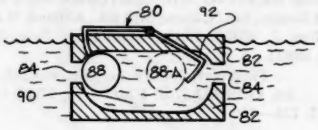
a partition arranged within the hollow body for dividing the interior of the hollow body into an outer compartment and an inner compartment;

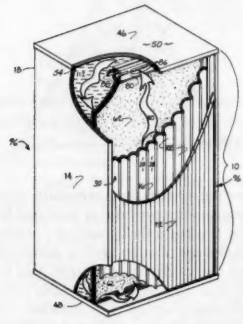
a first upper opening adjacent the top of the hollow body defining a liquid flow passageway past the partition intercommunicating the inner and outer compartments;

a second lower opening adjacent the bottom of the hollow

body defining a liquid flow passageway past the partition intercommunicating the inner and outer compartments;

a check valve disposed in one said openings for restricting liquid flow to one direction in a loop defined by the inner and outer compartments and the upper and lower openings, said check valve including a generally tubular shaped housing having an internal chamber, two generally opposed series of slots extending through said tubular housing, each series including a plurality of slots, said series defining inlet and outlet ports to said internal chamber, respectively, and a buoyant rod-like member disposed with in said chamber for controlling the flow of liquid through said valve by selectively blocking one of said inlet and said outlet ports; and





port means into said hollow body, for filling the body with said heat-transfer liquid for flow along said loop.

19. A reversible check valve for a liquid flow system comprising:

a generally tubular shaped housing having an internal chamber; two generally opposed series of slots extending through said housing, each series including a plurality of slots, said series defining inlet and outlet ports to said internal chamber and a rod-like member buoyant in said liquid, disposed within said chamber for controlling the flow of liquid through said valve by selectively blocking one of said inlet and outlet ports.

4,294,230

SOLAR ENERGY COLLECTION PANEL AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Jun. 25, 1979, Ser. No. 51,869

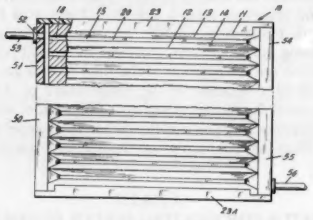
Int. Cl.³ F24J *3/02*

U.S. Cl. 126—438 **11 Claims**

1. A solar energy unit comprising an integral unitary metal panel structure having a front face adapted to receive solar energy, said unitary panel structure containing a plurality of closely spaced parallel cavities formed therein and extending inwardly of said front face of said panel structure, said cavities having side wall portions which converge inwardly toward each other, each of said cavities having a bottom wall portion joining said side wall portions together,

said side wall portions of said cavities of said unitary panel structure being highly reflective of sunlight directed against the face of said panel structure containing said cavities and being angled to reflect such sunlight between said converging wall portions toward the bottom of each cavity,

the bottom wall portion of each of said cavities having a sunlight absorbing material to permit sunlight which is directed into the cavities and reflected off the side wall portions of the cavities to be absorbed by said bottom wall portions, whereby concentrated heat of the absorbed sunlight will be conducted from the locations where the energy is absorbed through bottom portions of the panel structure,



a plurality of parallel fluid conduits underlying said bottom portions and coextensive with said cavities and formed integral within and extending through said unitary panel structure and containing heat transfer fluid in closely spaced heat transfer relationship with respective bottom portions of said panel structure which are directly aligned with said cavities therein,

said conduits containing heat transfer fluid adapted to receive heat transferred thereto through said bottom wall portions of said cavities of said panel structure and being aligned with respective of said cavities.

4,294,231

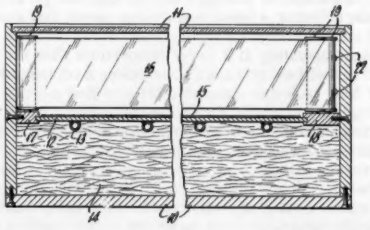
HEAT INSULATOR

Marcel J. E. Golay, 1095 Lutry, Vd, Switzerland

Continuation of Ser. No. 833,253, Sep. 14, 1977, abandoned, which is a continuation of Ser. No. 591,694, Jun. 30, 1975, Pat. No. 4,084,574. This application Jun. 22, 1979, Ser. No. 51,162 The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—441 **6 Claims**



1. Radiant heat absorbing apparatus comprising a housing having at least one clear side, radiation absorbing means in said housing comprising a radiation absorbing surface facing said clear side, a radiation transparent plate closing said clear side of the housing and a plurality of ribbon-like elements of relatively low thermal conductivity insulating material spaced apart a distance not exceeding about 1 centimeter and positioned substantially normal to, between and spaced from said radiation absorbing surface and said transparent plate to restrict circulation of gas between said surface and said plate and

minimize loss of heat through convection while introducing negligible heat bypass between said surface and said plate.

4,294,232

SOLAR COLLECTOR

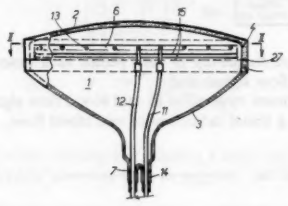
Jean-Louis Boy-Marcotte, Orsay; Henri D. M. Junot, Paris; Richard J. A. M. Grossin, Rueil-Malmaison, and Philippe J. M. R. Chevalier, Garancieres, all of France, assignors to Bertin & Cie, Plaisir, France

Filed Dec. 10, 1979, Ser. No. 101,575

Claims priority, application France, Dec. 8, 1978, 78 34553

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—443 **8 Claims**



1. A solar energy absorber unit of the evacuated flat-plate collector type, comprising the combination of:

a gastight enclosure designed for long-duration maintenance inside thereof of a high-order vacuum, said enclosure being made up of two opposite half-shells of glass which are glass-welded to each other all along their mating peripheries to form together an integral all-glass, airtight envelope having a generally flattened front-side window designed for exposure to the sun and a corresponding rear-side closure opposite said front-side window,

a solar-radiation flat-plate collector suspended inside said enclosure by a light-weight low-conduction suspension secured to the wall of said envelope, to thereby stretch out behind said front-side window in non-conductive thermal relationship with said wall, at least the sun-exposed front-side face of said flat-plate collector bearing a selective coating adapted to increase solar radiation absorption and reduce infrared emission, and

a radiant screen formed of sheet material having low infrared emissivity, and in spaced relationship between said flat-plate collector and said rear-side closure, adjacent and generally parallel to the non sun-exposed rear-side face of said flat-plate collector to minimize radiation losses thereof and said solar screen being supported from said flat plate collector and out of physical contact with said rear side closure.

4,294,233

SLACK ABSORBING DEVICE FOR AN ENDOSCOPE

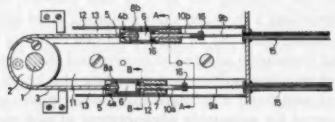
Nagashige Takahashi, Tokyo, Japan, assignor to Kabushiki Kaisha Medos Kenkyusho, Tokyo, Japan

Filed Apr. 5, 1979, Ser. No. 27,418

Claims priority, application Japan, Apr. 12, 1978, 53/47865[U]

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **7 Claims**



1. An endoscope having a distal and a proximal end, a manual operating section adjacent the proximal end and a bending section adjacent the distal end, a plurality of elongated passageways in said manual operating section extending lengthwise of said endoscope, a plurality of slack absorbing members, one said member being mounted for slidable movement in each said passageway, said slack absorbing members being connected to said operating section such that they are movable along the length of said endoscope within said passageways as said operating section is operated, each of said slack absorbing members being elongated in the direction of said movement and having a centrally located elongated groove extending in the direction of said movement, said groove having a threaded portion, at least two twisted wires each having two ends, one end of each wire being connected to said bending section and the other ends of said wires being connected to different ones of said slack absorbing members such that when said manual operating section is operated said wires are moved in such a way that said bending section bends, said wires having threaded rods connected to said other ends whereby said threaded rods are moved together with said wires at least when said wires are pulled towards said manual operating section, said passageways being partially defined by a removable cover member, said threaded rods being provided with an end piece, each threaded groove having an open portion extending for at least the length of said threaded portion such that when said cover member is removed each of said threaded rods are engageable with a respective threaded groove by positioning said threaded rods above said threaded grooves and lowering said rods into said grooves, said cover member and said end pieces being positioned and sized such that they prevent removal of said rods from said grooves.

4,294,234

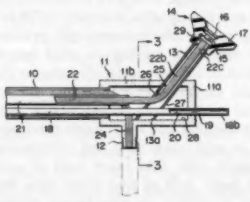
ENDOSCOPE

Kazumasa Matsuo, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1979, Ser. No. 51,034

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—6 **5 Claims**



1. An endoscope comprising:

an elongated rigid sheath to be inserted into a body cavity, said sheath having a base end and a distal end;

a control section housing having a side wall and an end wall connected to the base end of the sheath;

a rigid channel tube inserted within the sheath along the length of the sheath to permit an instrument such as catheter to be inserted therein, said channel tube having a base end extended into the housing and a distal end opened at the distal end of the sheath;

an insertion hole formed in the side wall of said control section housing;

an extension guide having an outer free end and an inserted end slantwise inserted into the housing through the insertion hole;

an eyepiece fitted over the outer free end of the extension guide;

an optical fiber bundle having a straight portion disposed in the sheath, a distal end extended in the distal end of the sheath, a base end portion bent relative to the straight portion, and a base end, said bundle being made rigidly in

the glass rodlike form over substantially the whole length; and

opening means mounted on the inserted end of the extension guide for introducing the base end portion of the fiber bundle into the insertion guide, so that said base end of the fiber bundle is optically coupled to the eyepiece, said opening means comprising an elongated cut out formed in said extension guide along the axial direction thereof and opened at the inserted end of the extension guide.

4,294,235

LARYNGOSCOPE

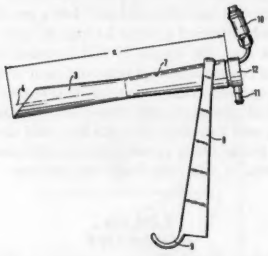
Karl Storz, Auf dem Schildrain 39, 7200 Tuttlingen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,703

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1977, 2751990

Int. Cl.³ A61B *1/06, 1/26*

U.S. Cl. 128—11 **3 Claims**



1. An injection breathing laryngoscope comprising: a laryngoscope tube having a proximal and a distal end, an axis, and an inner wall defining an axial passage from end to end, an insert tube having a proximal and a distal end, an axis, an inner wall defining an axial passage from end to end, and an outer wall so proportioned and arranged as rotatably to fit in said inner wall of said laryngoscope tube entering the proximal end of said laryngoscope tube, and having an axial length substantially shorter than that of the laryngoscope tube so that its distal end lies within said laryngoscope tube and substantially spaced from the distal end of said laryngoscope tube; fiber optics means and a breathing gas tube inside the insert tube passage and attached to said insert tube and terminating at said distal end of said insert tube, said inner wall of said laryngoscope tube and said outer wall of said insert tube having matching conical axially extending locking tapers, whereby said tubes can be rotated relative to one another with said tubes axially spaced apart, and locked in an adjusted position by pressing them axially together, and in which said laryngoscope tube flares outwardly from a medial location to its distal end.

4,294,236

FOOT EXERCISER

Steven R. Hofstein, North Brunswick, N.J., assignor to World Medical Marketing Corporation, New York, N.Y.

Division of Ser. No. 85,330, Oct. 29, 1979. This application Jan. 14, 1980, Ser. No. 111,876

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—25 B **2 Claims**

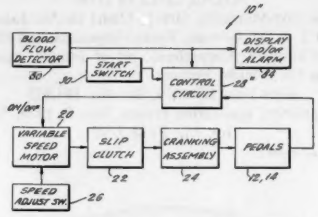
1. A foot exercising device, comprising:

a pair of foot pedals;

motor means for reciprocating said foot pedals;

blood flow detector means for detecting the flow of blood through a leg of a patient using said foot exercising device;

control means for controlling the operation of said motor means as a function of the blood flow through said patient as detected by said blood flow detector means, said control means causing the said motor means to vary the reciprocation frequency of said pedals as a function of said blood flow signal; and



display means responsive to said blood flow signal for providing a visual indication of said blood flow.

4,294,237

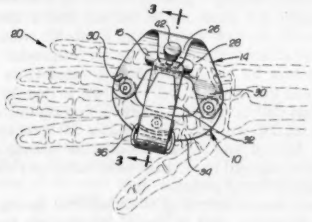
SPLINT FOR REDUCING FRACTURES OF THE METACARPALS

Calvin H. Frazier, 1808 Verdugo Blvd., Glendale, Calif. 91208

Filed Dec. 26, 1979, Ser. No. 107,025

Int. Cl.³ A61F *5/10*

U.S. Cl. 128—77 **9 Claims**



1. An apparatus for reducing a fracture of the metacarpal comprising:

a generally rigid foundation having a reducing portion overlying the dorsum of the hand adjacent at least one metacarpal of said hand, said reducing portion being generally coplanar to said dorsum, and a support portion whose longitudinal cross section has a curved shape that is shaped complementary to the ulnar side of said hand, said support portion extending from said dorsum around said ulnar side of said hand and terminating in a support end, said support end being generally coplanar to the palm of said hand and having a width that exceeds the width of said reducing portion;

means for securing said foundation to said hand, said means being adjustable to compensate for variations in sizes of hands; and

means for reducing the apex of said fracture, said means comprising a threaded shaft mounting at an upper end an adjusting knob and an aperture in said reducing portion of said foundation adapted to receive said shaft connected to said reducing portion and mounting at a lower end adjacent said hand a pressure distributing plate, said means adapted for adjustable advancement of said plate from a first position adjacent said reducing portion to at least one other position further below said reducing end.

4,294,238

LOWER LIMB MUSCLE AID DEVICE

Thomas J. Woodford, Benton Harbor, Mich., assignor to Stephen C. Small, Benton Harbor, Mich., a part interest

Filed Sep. 21, 1979, Ser. No. 77,600
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 G **10 Claims**

1. A device for assisting and relaxing a user's leg muscles in and after physical activities such as jogging, said device comprising:

a strap member having a top end, a bottom end, and an elastic midportion having a width substantially the width of a user's heel;

a first securing means extending from said top end and defining means for releasably encircling the user's leg adjacent the knee for securing said top end of the strap member thereto; and

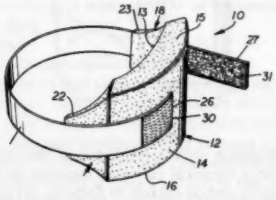
a second securing means extending from said bottom end and defining means for releasably encircling the user's foot for securing said bottom end of the strap member thereto with said midportion stretchably retained against the calf of the user's leg and said bottom end extending around the user's heel and underlying the arch of the user's foot for providing a supportive force on the user's leg during a physical activity such as jogging.

4,294,239

STEADY SUPPORT ABDOMINAL SPLINT

W. Wayne Oram, 2108 Chambwood Dr., Charlotte, N.C. 28205; Nora L. Oram, 525 Manhasset Rd., Charlotte, N.C. 28209, and Robert W. Boris, 405 Bluegrass Dr., Morristown, Tenn. 37814

Filed Apr. 6, 1979, Ser. No. 27,766
Int. Cl.³ A61F *5/24, 5/28, 5/30*
U.S. Cl. 128—96 **2 Claims**



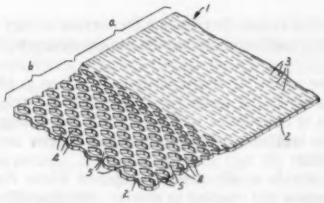
1. A splint supporting the front abdomen of a human body and directing pressure to localized regions of the abdomen of a human body, comprising a molded pad of resilient material formed in an approximate U-shape with a front portion of substantially uniform thickness and height and including top edge, bottom edge, convex outer surface, concave body facing surface, and opposite end portions, said end portions being curved with respect to said front portion to extend partially about the sides of the abdomen of the human body, said front portion merging into said end portions and each end portion symmetrically diminished in height and the outer surface of each end portion tapered toward its body facing surface whereby the thickness of each end portion is diminished, said body facing surface being of a width sufficient to span the width of the human body across the abdomen and said pad being of a height sufficient to approximately cover the abdominal area of the body without extending over the thorax and formed in a size and shape along said body facing surface for conforming to the shape of the front abdominal area of the human body, the material of said pad having a density of between 2.5 and 3.5 pounds per cubic foot and a load bearing (ILD) of a twenty-five percent load deflection value at between 25 and 35 pounds, strap means for extending from said end portions and about the abdomen to urge said pad in constant contact with the abdomen to apply approximately uniform support pressure to the abdomen, said end portions being of a height at least as wide as said strap means, said pad being fabricated of material sufficiently flexible to permit a force applied externally to the pad to transmit localized pressure through the pad to the abdomen, whereby the pad is held by the strap against the abdomen and the wearer can press inwardly with his hand against the outside surface of the pad when coughing to apply additional pressure to a localized area of the abdomen.

4,294,240

PERFORATED CLOSED CELL PADDING MATERIAL

Gary A. Thill, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 815,857, Jul. 14, 1977, abandoned. This application Aug. 17, 1979, Ser. No. 67,394
Int. Cl.³ A61L *15/00*
U.S. Cl. 128—156 **8 Claims**



1. A combination for rendering a portion of the body relatively immobile, said combination comprising an orthopedic device which renders the portion of the body relatively immobile and a padding material, said padding material consisting essentially of a closed cell polymeric foam, said foam being water repellent at least to the extent that water penetrates the foam with difficulty, said padding material being conformable, being resiliently compressible, containing perforations capable of passing perspiration from human skin therethrough and being elastic in the longitudinal direction.

4,294,241

COLLAGEN SKIN DRESSING

Teruo Miyata, No. 314, 3-6-29, Shimoochiai, Shinjuku-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 805,003, Jun. 9, 1977, abandoned. This application Oct. 19, 1979, Ser. No. 86,547
Int. Cl.³ A61L *15/00*
U.S. Cl. 128—156 **8 Claims**

5. A method for the preparation of a collagen skin dressing in sheet from whose upper and lower surfaces possess differing porosity characteristics which comprises the steps of:

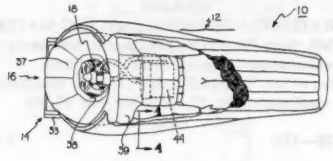
(a) treating a source of collagen with a proteolytic enzyme to form a telopeptide-poor, monomolecularly dispersed atelocollagen extract,

(b) precipitating atelocollagen from the extract,
(c) purifying the precipitated atelocollagen by redissolving and reprecipitation,
(d) converting the extracted, purified atelocollagen to a gel,
(e) extruding the atelocollagen gel through a circular extrusion nozzle in a coagulation bath,
(f) recovering atelocollagen in tubular form from the coagulation bath,
(g) slitting the tubular collagen longitudinally to form a collagen sheet therefrom,
(h) cross-linking the longitudinal sheet,
(i) partially air-drying the cross-linked sheet, and
(j) freeze-drying the partially air-dried sheet whereby the upper surface of said sheet becomes more concentrated in atelocollagen content with the lower surface thereof.

4,294,242
SURVIVAL SYSTEM

Kenneth W. Cowans, Encino, Calif., assignor to Kinergetics, Inc., Tarzana, Calif.

Filed Mar. 31, 1980, Ser. No. 135,979
Int. Cl.³ A62B 7/10
U.S. Cl. 128—201.13 **13 Claims**



1. A passive system for reducing the thermal energy losses of a person in a confined cold hyperbaric environment, comprising:

insulative means for encompassing the person at all but the face region, the insulative means having at least four inches of conductive path length and comprising interior fibrous insulation providing minimal interior convection currents;

carbon dioxide scrubber means disposed within the insulative means and coupled to receive expiratory flows from the person, such that the heat and moisture in the expiratory flows together with the encompassing insulative means establish an efficient exothermic reaction contributing heat to the person; and

regenerator means coupled to receive expiratory flow from the scrubber means and communicating with the environment to provide inspiratory flows from said scrubber means therethrough to the person, the regenerator means being configured to couple expiratory flows to the environment while storing heat and moisture contained therein, and to give up the heat and moisture to inspiratory flows.

4,294,243
RESPIRATORS

John Ernsting, Fleet; Thomas R. Morgan, Farnborough; Leonard F. W. Palmer, Aldershot; Alfred J. Rivers, Church Crookham, all of England, and Stephen M. Robson, RAF St. Athan, Wales, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 8, 1978, Ser. No. 967,122
Int. Cl.³ A62B 7/00
U.S. Cl. 128—201.18 **8 Claims**

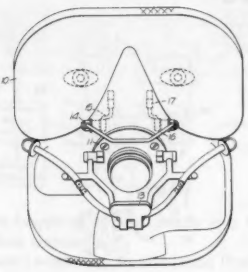
1. An oro-nasal respirator, comprising:

a. a visor;

b. a mask carried by said visor, said mask having a shape adapted to cover the nose and mouth of the wearer;

c. means for providing respiratory gas to the wearer through said mask;

d. means attached to said mask for selectively occluding the wearer's nose; said last mentioned means including a pair of spaced apart pivots penetrating through said mask in

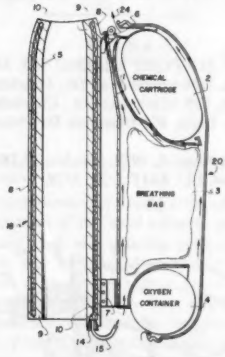


the nasal region thereof; yoke arms extending radially from said pivots on the inside of said mask; a handle secured to said pivots on the outside of said mask; said handle operable to rotate said pivots and cause said yoke arms to turn into the sides of the wearer's nose.

4,294,244
RESPIRATOR WITH A COOLING DEVICE

Adalbert Pasternack, Bad Schwartau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 115,877
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1979, 2903920
Int. Cl.³ A62B 7/08
U.S. Cl. 128—202.26 **1 Claim**



1. In combination with a respirator of the type having a carrying frame, a chemical cartridge mounted to the carrying frame for binding carbon dioxide or forming oxygen or both, a breathing bag mounted to the frame and an oxygen supply container mounted to the frame, means for communicating said cartridge, breathing bag and supply container such that exhaled gas from a user is recirculated therethrough for rebreathing, wherein the frame includes ducting means for passing a cooling gas flow over the oxygen container, the breathing bag and the cartridge, a vest adapted to be worn by a person comprising an outer wall of flexible material, an inner wall of flexible material spaced from the outer wall to define a spacing therebetween, a coolant medium comprising dry ice which sublimates to create carbon dioxide coolant gas mounted in

said spacing, means for mounting the respirator adjacent of said vest, and further comprising means for discharging said carbon dioxide coolant gas from said spacing to said ducting means for passing the coolant gas to effect a coolant flow over the oxygen container, the breathing bag and the chemical cartridge.

4,294,245

PERIOPERATIVE APPLICATION OF ELECTRONIC PAIN CONTROL IN COMBINATION WITH ANESTHETIC AGENTS

Joseph G. Bussey, Austell, Ga., assignor to Stimtech, Inc., Minneapolis, Minn.

Filed Mar. 24, 1980, Ser. No. 133,211
Int. Cl.³ A61N *1/30*
U.S. Cl. 128—207.21 **7 Claims**

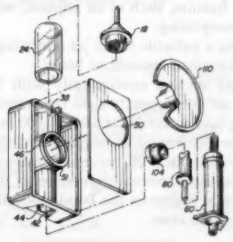
1. An improved method of preparing a patient for surgery, and for alleviating sensation of a patient during surgery, wherein the improvement comprises applying transcutaneous electrical nerve stimulation at least one point proximal to the site of incision, administering an anesthetic agent, and proceeding with surgery with the patient under the combined synergistic influence of said simulator and said agent.

4,294,246

FLOW CONTROL DEVICE FOR ADMINISTRATION OF INTRAVENOUS FLUIDS

Jerry L. Aslanian, Phoenix, and Jody L. Numbers, Scottsdale, both of Ariz., assignors to Master Medical Corporation, Phoenix, Ariz.

Filed Jan. 22, 1979, Ser. No. 5,313
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 E **4 Claims**



1. A metering device for accurately setting flow rates in an IV system including a source of IV or parenteral fluid, said valve comprising:

(a) a housing;

(b) a fluid passageway within said housing;

(c) a valve seat in said passageway having a valving surface;

(d) a cylindrical metering member axially moveable relative to said valve seat, said metering member including a cam follower and said member further defining a flow passage in the wall surface having a cross-sectional area which varies axially along at least a section of said flow passage;

(e) actuating cam means having a generally spiral cam surface cooperable with said cam follower;

(f) biasing means urging said metering member into engagement with said cam surface in a direction to reduce flow; and

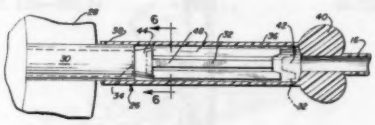
(g) dial means moveable relative to said housing for imparting rotational movement to said actuating cam means whereby said cam surface axially displaces said member relative to said valving seat surface to progressively regulate flow from a closed to a purge position with flow metering occurring along said portion of said flow passage which varies in cross-sectional area.

4,294,247

FRANGIBLE, RESEALABLE CLOSURE FOR A FLEXIBLE TUBE

Garry L. Carter, Palatine; Daniel B. Granzow, Arlington Heights, and Edward L. Bayham, Mundelein, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 818,357, Jul. 25, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,395
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 D **11 Claims**



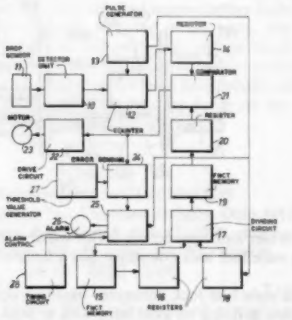
1. In a flexible tube, valve means which comprises: a tubular portion having a closed end; an elongated, generally rigid member carried on the exterior of said closed end and positioned within said flexible tube; and frangible means to permit the opening of said closed end by manual manipulation of said elongated member from outside of the flexible tube, to separate said elongated member from the tubular portion and to open said closed end, said elongated rigid member being adapted to fit in sealing relation within said tubular portion after said opening to permit resealing of the valve.

4,294,248

DEVICE FOR AUTOMATICALLY CONTROLLING THE INFUSION LIQUID FLOW IN AN INFUSION APPARATUS

Nuno R. M. de Figueiredo, Högstigen 5, 182 74 Stocksund, Sweden

Filed Oct. 16, 1979, Ser. No. 85,281
Claims priority, application Sweden, Oct. 19, 1978, 7810917
Int. Cl.³ A61M *5/6*
U.S. Cl. 128—214 E **7 Claims**

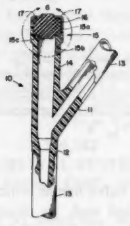


1. A device for automatically controlling infusion liquid flow in an infusion apparatus comprising first means for successively adjusting the actual value of said flow towards a desired value of said flow, second means for successively adjusting said desired value of the flow, and third means for successively calculating the value of the instantaneously remaining portion of a preselected total infusion liquid volume intended for infusion during a given total time, said second means being responsive to said third means.

4,294,249
SWAGE-MOLDED INJECTION SITE

Neil J. Sheehan, Berkeley, and Melvin H. Norman, Oakland, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Oct. 18, 1979, Ser. No. 85,841
Int. Cl.³ A61M 5/00
U.S. Cl. 128—214 G 7 Claims



1. An injection site, comprising in combination:

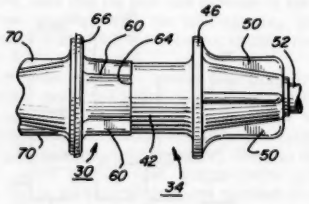
a. a self-sealing, puncturable member of resilient material, said puncturable member being a generally cylindrical body having a top surface on which is centrally located a flat, smooth surfaced raised projection, and

b. a generally tubular, plastic housing wherein said puncturable member is compressibly confined, said housing having a top receptor portion whose inside diameter is greater than the inside diameter of the remaining portion of the housing so as to provide a ledge on which said puncturable member rests, the top receptor portion having a swage-molded top edge which extends over at least a portion of the top surface of said puncturable member, said swagemolded top edge being below the flat surface of said raised projection.

4,294,250
LUER LOCK CONNECTION DEVICE

T. Michael Dennehey, Arlington Heights, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 7, 1979, Ser. No. 101,246
Int. Cl.³ A61M 3/00
U.S. Cl. 128—247 12 Claims



1. A luer lock connection device which comprises: a cooperating male luer lock connector and a female luer lock connector;

said male luer lock connector having a central tubular portion defining an axial bore with at least a portion of said central tubular portion being enclosed by an outer sheath having a generally circular cross-sectional configuration;

said outer sheath having internal connecting means for cooperating with external connecting means of said female luer lock connector;

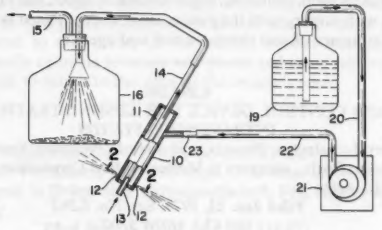
said female luer lock connector comprising a main tubular member for receiving said central tubular portion and having said external connecting means for cooperating with the internal connecting means of said male luer connector's outer sheath; and

said main tubular member of said female luer connector having visual indicating means which is positioned to indicate that the male and female connectors are assembled properly for use when said outer sheath and said visual indicating means are in a predetermined relationship.

4,294,251
METHOD OF SUCTION LAVAGE

A. Seth Greenwald, 2235 Tudor Dr.; Jack M. Geiger, 2713 Hampshire Rd., both of Cleveland Heights, Ohio 44106; Nathaniel C. Narten, 3732 Northhampton Rd., Cleveland Heights, Ohio 44121; Derek S. Porritt, 3263 Granger Rd., Medina, Ohio 44256; Steven P. Combs, 404 DuPont Way, Dayton, Ohio 45433, and John J. Brems, 1591 Grace Ave., Lakewood, Ohio 44107

Continuation of Ser. No. 952,195, Oct. 17, 1978, abandoned.
This application Jul. 21, 1980, Ser. No. 170,596
Int. Cl.³ A61M 1/00
U.S. Cl. 128—276 3 Claims



1. A suction lavage method to improve the bond strength of a prosthetic fixation, such as an implant, with reamed cancellous bone, comprising:

A. applying a pulsatile water jet operating in an air environment to reamed cancellous bone;

B. applying suction contiguously with the water jet at a greater suction capacity than the water jet flow;

C. pulsing said water jet at about 2100 pulses per minute;

D. pressure cementing an implant into the cancellous bone which results in a 20 percent greater penetration of cement into the trabecular interstices of the cancellous bone and greatly improves the bond strength between the implant and the bone.

4,294,252
OSTOMY DEVICE

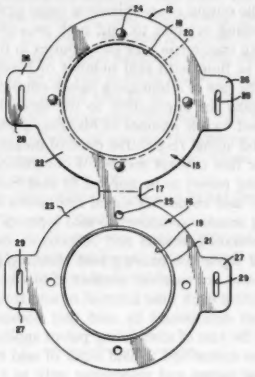
Eystein Einset, 1916 Sunset Dr., St. Joseph, Mich. 49085

Filed Nov. 5, 1979, Ser. No. 91,338
Int. Cl.³ A61F 5/44
U.S. Cl. 128—283 11 Claims

1. In an ostomy device having a drainage sleeve provided with a flexible connecting neck defining an inlet opening, improved retaining means for use in retaining the sleeve neck to a user's body in alignment with a stoma therein for collecting material draining outwardly through the stoma, said retaining means comprising

a one-piece gasket including a first inner clamp half provided with a first drain opening, a second outer clamp half provided with a second drain opening, a hinge comprising portions of said clamp halves connecting the clamp halves for selective spaced disposition and facially overlying clamping disposition with said drain openings aligned, cooperating means on said clamp halves for sealingly securing said sleeve neck between said clamp halves in said clamping disposition with said neck passed through said second drain opening of the outer clamp half and outturned between said clamp halves with said inlet opening aligned with said first drain opening of the inner clamp

half, and at least two different types of releasable interlock means for releasably interlocking said clamp halves in said clamping disposition; and



means for preventing disengagement of said interlock means when the device is being retained to the user's body.

4,294,253

TAMPON WITH A NON-WOVEN WRAP

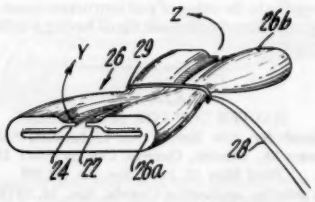
Axel Friese, Wuppertal, Fed. Rep. of Germany, assignor to Carl Hahn, G.m.b.H., Dusseldorf, Fed. Rep. of Germany

Filed Dec. 3, 1979, Ser. No. 99,771

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2855179

Int. Cl.³ A61F *13/20*

U.S. Cl. 128—285 **1 Claim**



1. An absorbent body suitable for compressing into a catamential tampon comprising:

a flat cushion of absorbent material enveloped by a liquid permeable cover and having a top face,

said cushion extending in a longitudinal direction and consisting of three longitudinally successive sections; namely, a front section defined by a front edge and a front fold line, a central section defined by said front fold line and a rear fold line, and a rear section defined by said rear fold line and a rear edge;

said front and rear sections being folded onto the top face of said central section about said front and rear fold lines, respectively, with said front and rear edges facing one another;

a withdrawal cord fastened longitudinally around said folded cushion and dividing said cushion therewith into two lateral sections;

the two lateral sections being folded toward each other about said withdrawal cord with the folded front and rear sections facing each other;

said absorbent body further provided with a reinforcing strip of material sandwiched between the absorbent material and the liquid permeable cover at the area of the cushion underlying the withdrawal cord.

4,294,254

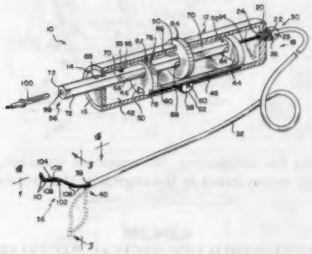
SURGICAL APPARATUS

Dale L. Chamness, 621 Pleasant Ridge Rd., Bloomington, Ind. 47401

Continuation-in-part of Ser. No. 858,712, Dec. 8, 1977, Pat. No. 4,256,113. This application Oct. 19, 1979, Ser. No. 86,588

Int. Cl.³ A61B *17/00*

U.S. Cl. 128—303.14 **14 Claims**



1. An apparatus including a sheath having proximal and distal ends, a member disposed within the sheath and movable longitudinally therein, the movable member having proximal and distal ends, and a surgical instrument operable by movement of the distal end of the movable member with respect to the distal end of the sheath, an operating assembly comprising first means for moving the movable member longitudinally with respect to the sheath, second means for rotating the movable member within the sheath, and a body for supporting the first and second means, the body including a portion for fixed attachment of the proximal end of the sheath thereto, said portion of the body further defining an aperture through which the proximal end of the movable member movably extends, the proximal end of the movable member being coupled to the first and second means for movement thereby, the first means including a slide supported in the body for movement longitudinally thereof, the body including means defining an interior and the slide including means shaped to slide in the interior and a driven portion, the first means further including a first thumbwheel rotatably mounted in the body, the first thumbwheel providing a driving portion to engage the driven portion, the first means further including means for providing a braking force on the first thumbwheel, manipulation of the first thumbwheel overcoming the braking force on the first thumbwheel to cause movement of the slide.

4,294,255

INTRALUMINAL ANASTOMOSIS

Andre Geroc, 1823 Lee Rd., Cleveland Heights, Ohio 44118

Continuation of Ser. No. 890,914, Apr. 17, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 106,926

Int. Cl.³ A61B *17/04*

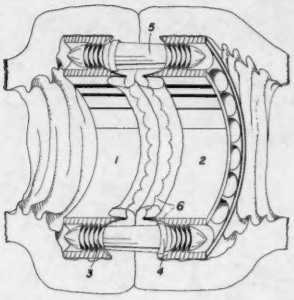
U.S. Cl. 128—334 C **7 Claims**

1. Anastomosis devices for intraluminal, end-to-end connection of the severed ends of an intestine or other tubular organ, the devices including a pair of mating, ring-shaped, clamping members, each of the members comprising:

(a) a circumferential, laterally extending, sharpened rim, the rim being located adjacent a radially innermost portion of the member;

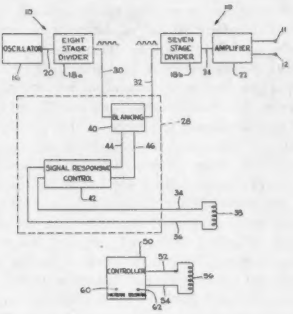
(b) a second, laterally extending rim, the second rim extending outwardly of the member on the same side as the sharpened rim but to a lesser extent than the sharpened rim, the second rim being located adjacent a radially outermost portion of the member;

(c) a groove located intermediate the sharpened rim and the second rim; and



(d) means for connecting the members together, the connecting means being in the region of the groove.

4,294,256
RATE CONTROLLED DIGITAL PACEMAKER
Wilson Greatbatch, 5220 Donnington Rd., Clarence, N.Y. 14031
Filed Jul. 16, 1979, Ser. No. 57,745
Int. Cl.[3] A61N *1/36*
U.S. Cl. 128—419 PT **11 Claims**



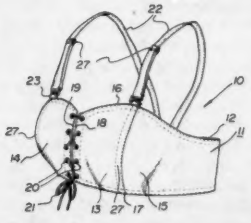
1. In combination with a cardiac pacer comprising electrode means adapted to be operatively connected to a patient's heart for applying stimulating pulses thereto, a source providing an output train of electrical pulses having a constant frequency and including oscillator means providing a train of output pulses at a relatively high frequency and means for converting said high frequency pulses to pulses having a lower frequency suitable for heart stimulation comprising a first component including a plurality of frequency divider stages having an output and having an input connected to said oscillator output and a second component including a plurality of frequency divider stages having an input and an output, and coupling means connected to the output of said second component of said frequency converting means for coupling said lower frequency pulses to said electrode means;

(a) pulse rate control means connected in series between said output of said first component of said frequency converting means and said input of said second component of said frequency converting means, said pulse rate control means comprising means for providing a path for said train of pulses from the output of said first component to the input of said second component of said frequency converting means, blanking pulse generating means having an input and an output and connected in synchronized relation to said output of said first frequency converting means for generating blanking pulses of a number determined by signal conditions at said input of said generating means during each time interval of said train of pulses and in synchronism with said train of pulses, and means for connecting the output of said blanking pulse generating means in controlling relation to said path providing means for preventing transmission of those pulses in the train which coincide in time with said number of blanking pulses to change the rate of stimulating pulses coupled to said electrode means for application to the heart by an amount determined by the number of blanking pulses;

(b) command signal responsive control means connected to said pulse rate control means for controlling the number of blanking pulses to be applied to said train of pulses in said path, said command signal responsive control means including means connected to said input of said blanking pulse generating means and responsive only to a first command signal for causing said blanking pulse generating means to increase the number of blanking pulses generated during each time interval of said train of pulses by an amount determined by said first command signal to decrease the rate of stimulating pulses applied to the heart and means connected to said input of said blanking pulse generating means and responsive only to a second command signal for causing said blanking pulse generating means to decrease the number of blanking pulses generated during each time interval of said train of pulses by an amount determined by said second command signal to increase the rate of stimulating pulses applied to the heart; and

(c) auxiliary control means adapted to receive at least two instruction inputs at a location physically separate from said cardiac pacer and operatively coupled to said command signal responsive means for generating said first and second command signals to change the rate of stimulating pulses applied by said electrode means to the heart, said auxiliary control means including means responsive to one of said instruction inputs for generating said first command signal having a given characteristic and means responsive to the other of said instruction inputs for generating said second command signal having a different characteristic.

4,294,257
HALTER TOP FOR SPORTS SUIT
Linda Rennhofer, c/o Ronald M. Lieberman, Suite 201, 2 Gloucester St., Toronto, Ontario, Canada (M4Y 1L5)
Filed May 15, 1979, Ser. No. 39,298
Claims priority, application Canada, Apr. 24, 1979, 326248
Int. Cl.[3] A41C *3/00*; A41D *5/00*; A47K *13/00*
U.S. Cl. 128—495 **12 Claims**



1. A halter top formed of substantially non-stretchable material for a sports outfit for females comprising the combination of:

(a) a body encircling portion constituted by a discontinuous panel having a pair of free lateral edges and cooperating means at said free lateral edges to hold said free lateral edges together, said body encircling portion being provided with

(i) a pair of discrete, separated breast-receiving and supporting cups, each said cup including a vertical seam therein bisecting said cup, the preselected variable but permanent location of said vertical seam thereby providing preselected different cup sizes, the top edge of said breast-receiving and supporting cup being so curved as to follow the natural incline of said breasts, the lower edge of said breast-receiving and supporting cups being so curved as to fit below the breasts, and

(ii) means constituted mainly by said cooperating means for adjustably interconnecting said free lateral edges with a predetermined spacing therebetween while thus simultaneously separating one said breast cup from its adjacent said breast cup;

(b) means for adjustably securing said halter top to the upper chest portion of a female body;

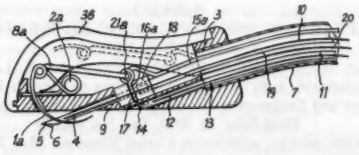
whereby, in use, the breasts are held firmly yet comfortably against the body, with the breast being urged towards each other and inwardly towards the body.

4,294,258

MEASURING HEAD ENABLING THE PRODUCTION OF PHYSIOLOGICAL MEASUREMENT SIGNALS DESIGNED TO BE POSITIONED ON OR IN CORPOREAL PARTS

Claude Bernard, Le Plessis-Robinson, France, assignor to Agence Nationale de Valorisation de la Recherche (Anvar), Neuilly-sur-Seine, France

Filed Mar. 19, 1979, Ser. No. 21,779
Claims priority, application France, Mar. 23, 1978, 78 08428
Int. Cl.[3] A61B 5/00, 5/04
U.S. Cl. 128—635 **32 Claims**



1. A measuring head adapted to be positioned on or in corporeal parts of a living body, said head comprising:

an insulating body,

said insulating body having a first electrode means which is sensitive to electrical activity of said corporeal parts, an electrical lead operatively connected to and extending from said first electrode means,

said insulating body also having a second electrode means which is sensitive to an ionic or physical activity of said corporeal parts, an electrical lead operatively connected to and extending from said second electrode means,

an elongated sheath means being connected to and extending from said insulating body, said electrical leads extending from the insulating body along said sheath means,

said insulating body having a claw means movable between a retracted position within said insulating body and an extended position out of said insulating body whereat it is positioned to enter the corporeal parts, to thereby secure the measuring head to the corporeal parts,

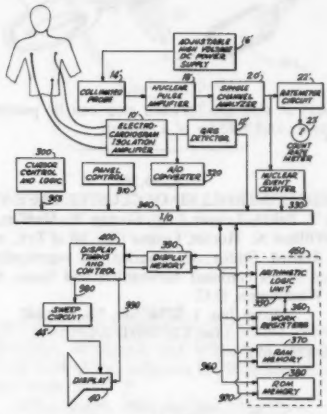
control means for moving the claw means between said retracted and extended positions such that in the said extended position the claw means has entered the corporeal parts while said first and second electrode means simultaneously engage the corporeal parts.

4,294,259

METHOD AND APPARATUS FOR CHARACTERIZING BLOOD FLOW THROUGH THE HEART

Thomas Picunko, Bronxville, N.Y.; Henry H. Kramer, Mahwah, N.J.; Naim G. Dam, Bayside, and Robert I. Gray, Irvington, both of N.Y., assignors to Bios Inc., Valhalla, N.Y.

Filed Nov. 25, 1977, Ser. No. 854,537
Int. Cl.[3] A61B 5/02
U.S. Cl. 128—653 **18 Claims**



1. Apparatus for characterizing blood flow through a heart for analysis of individual cardiac cycles comprising:

a nuclear detector probe responsive to the radioactive output of a radioactive trace introduced into a patient's blood stream to provide an output indicating the amount of radioactivity at a selected location of the heart blood pool,

a time base generator to provide a time base that is divided into successive time intervals,

a counter of said detector output,

a memory to store counts from said counter over each of said time intervals,

a programmable computer responding to said counts of certain of said time intervals to compute the value of a predetermined parameter of the patient's blood flow simultanous with each cardiac cycle being detected,

a display of said value of said predetermined parameter substantially simultaneous with the computation thereof,

said computer calculations and said display being substantially simultaneous with the production of said detector output signal and changing in response to changes of said detector output signal.

4,294,260

CYSTOURETHROGRAPHIC EXAMINATION CHAIN

William M. Veatch, Olympia, Wash., assignor to Olympia Radiological Associates, Olympia, Wash.

Filed Jun. 18, 1979, Ser. No. 49,503
Int. Cl.[3] A61B 6/00
U.S. Cl. 128—654 **2 Claims**

1. A flexible insert for cystourethrographic examination, comprising:

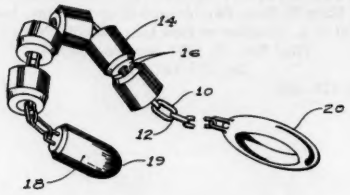
an elongated continuous radio opaque flexible tensioning member having a plurality of interconnected rigid chain links,

a forward stop fastened to an end of the tensioning member and having a smoothly contoured continuous forward end,

a rearward stop fastened to the tensioning member, and

a plurality of radio opaque bead members having axially opposite flat ends slidably mounted on the chain links between said forward and rearward stops whereby press-

ing the bead members forward against the forward stop will push the flat ends of the beads together to rigidify the



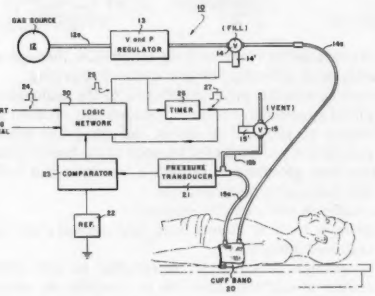
insert so that the forward stop can be pushed into the urethra and bladder of a patient.

4,294,261

LOGIC-CONTROLLED OCCLUSIVE CUFF SYSTEM

Joseph T. Baker, League City; George W. Hoffler, Seabrook, and William N. Hursta, League City, all of Tex., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 1, 1976, Ser. No. 691,647
Int. Cl.[3] A61B 5/02
U.S. Cl. 128—691 **4 Claims**



1. A cuff system for occulding venous return from a limb, comprising:

a pressure cuff;

a source of pressurized gas;

means including a solenoid-operated fill valve for selectively coupling said gas source with said cuff, said fill valve being opened in response to a high level energizing electrical fill signal which energizes the solenoid associated with said fill valve and being closed in response to the application of a low level electrical signal to said solenoid-operated fill valve;

regulator means for controlling the pressure and volume of gas flowing from said source when coupled to said cuff;

means including a solenoid-operated vent valve for venting said cuff to the ambient atmosphere, said vent valve being closed in response to application of a low level electrical signal which deenergizes the solenoid associated with said vent valve and said vent valve being opened in response to application of a high level electrical signal which energizes the vent solenoid;

means for supplying a high level energizing electrical fill signal to said solenoid-operated fill valve to open said fill valve and maintain the fill valve in open condition whereby the cuff receives gas from said pressurized source;

means including a timer means instantly operative in response to said fill signal for producing a low level deenergizing close vent signal for a predetermined period of time and applying said low level close vent signal to said vent valve to close said vent valve through said time period;

a pressure transducer fluidly coupled with said cuff, said transducer measuring the fluid pressure in said cuff and generating a transducer output electrical voltage signal proportional to said pressure;

a source of reference voltage;

means operatively associated with said pressure transducer and said reference voltage source for terminating said high level energizing electrical fill signal and applying a second low level electrical signal to said solenoid-operated fill valve to close said fill valve when the ratio between said transducer electrical output voltage signal and said reference voltage signal reaches a predetermined value whereby said cuff is in a pressure holding condition while the vent remains closed; and

means responsive to the termination of said low level deenergizing close vent signal at the end of said time period to energize said solenoid-operated vent valve to open condition and thereby depressurize said cuff; said system further comprising:

an AND gate,

a pressure latch,

a start latch,

each one of said latches having a set, reset, and output terminals, the output of said pressure latch being coupled to one input of said AND gate, the output of said start latch being coupled to the other input of said AND gate,

means coupling the output of said start latch to the input of said timer and to the reset terminal of said pressure latch,

means coupling the output of said timer to the reset terminal of said start latch,

means coupling the output of said AND gate to said fill valve; and

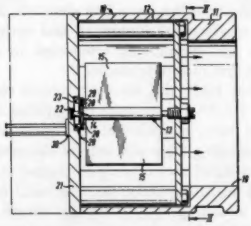
said system adapted to start a pressurization cycle upon the application of a start signal to the set terminal of said start latch.

4,294,262

APPARATUS FOR MONITORING RESPIRATORY PERFORMANCE

Garnet M. E. Williams, Edmonton, and James E. L. Hollis, Portsmouth, both of England, assignors to Ferraris Development and Engineering Company Limited, London, England

Filed May 30, 1979, Ser. No. 43,772
Claims priority, application United Kingdom, May 31, 1978, 25443/78
Int. Cl.[3] A61B 5/08
U.S. Cl. 128—726 **6 Claims**



1. Respiratory performance monitoring apparatus comprising means forming a chamber having a wall formed by a non-magnetizable material and ports whereby respiratory gas flow to be monitored when the apparatus is being used is passed through said chamber, and a pneumatic-to-electric transducer adapted to actuate an electronic readout unit, the transducer including a rotor mounted rotatably within said chamber so as to be driven by respiratory gas flow through said chamber, at least one rare earth magnet mounted on said rotor, and a sensi-

tive Hall effect sensor mounted outside the chamber on the opposite side of said wall in close proximity to the path of rotation of said at least one magnet within said chamber whereby an output indicative of rotation of the rotor can be derived from output signals emitted by said Hall effect sensor, the Hall effect sensor and the non-magnetizable material of said wall being able to withstand temperatures of the order to which the apparatus is subjected for sterilization purposes.

4,294,263

SYSTEM FOR DETECTING PROBE DISLODGEMENT

Benjamin L. Hochman, Doylestown, Pa., assignor to Air Shields, Inc., Hatboro, Pa.

Continuation-in-part of Ser. No. 858,401, Dec. 7, 1977, abandoned. This application Sep. 13, 1979, Ser. No. 75,253

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—736 **23 Claims**

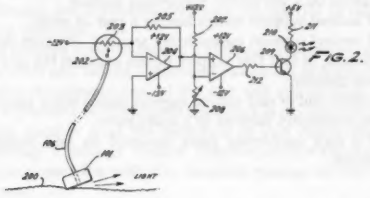


FIG. 2.

1. Apparatus for sensing skin contact probe dislodgement, comprising:

(a) housing means defining a skin contact surface for said probe;

(b) photoreceptive means located on said skin contact surface of said housing means;

(c) alarm means energized by reception by said photoreceptive means of light, said light having an intensity exceeding a predetermined level, said alarm means being placed a distance away from said housing means; and

(d) photo transmitting means extending out from said housing means for connecting said photoreceptive means and said distant light receptive alarm means.

4,294,264

CERVIX-TO-RECTUM MEASURING DEVICE IN A RADIATION APPLICATOR FOR USE IN THE TREATMENT OF CERVICAL CANCER

David R. Fischell, Ithaca, N.Y., and Jeffrey C. Mazique, Mt. Rainier, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 672,209, Mar. 31, 1976, abandoned. This application May 12, 1977, Ser. No. 796,258

Int. Cl.³ A61B *5/10*

U.S. Cl. 128—778 **1 Claim**

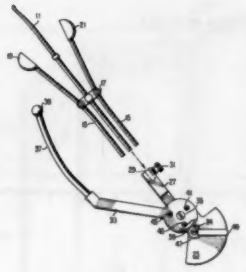
1. A device for use with a radiation applicator comprising:

a handle,

a single probe pivotably connected to said handle and insertable in a rectum,

means on said handle for coupling said handle to the applicator, and

means on said handle responsive to the displacement of said probe when inserted into a rectum relative to the applica-



tor when inserted into an uterine cervix for indicating the distance between said cervix and rectum.

4,294,265

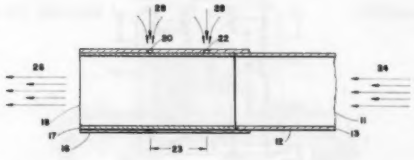
FILTER CIGARETTE WITH INLET VENT ZONES

Allen J. Kassman, Richmond, and Willard A. Geiszler, Jr., Chesterfield, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 4, 1980, Ser. No. 137,159

Int. Cl.³ A24D *1/04, 3/04*

U.S. Cl. 131—366 **9 Claims**



1. A mouthpiece affording coordinated control of the RTD, dilution and TPM of a cigarette, comprising:

a. a filter medium the outer surface of which is essentially air impervious;

b. inlet vents in said filter medium for admitting outside air for dilution, said inlet vents being in at least two groups, one group located closer to the tobacco end of said mouthpiece and separated from the other group by a distance by a distance effective to increase RTD large enough to be percieved by a smoker without appreciably decreasing dilution and the total particulate matter.

4,294,266

BENZODIOXANONES AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright; John B. Hall, Rumson, and Frederick L. Schmitt, Holmdel, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

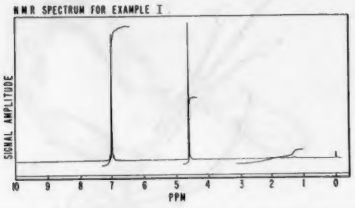
Division of Ser. No. 75,071, Sep. 13, 1979, Pat. No. 4,241,097. This application May 2, 1980, Ser. No. 145,985

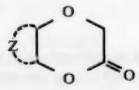
Int. Cl.³ A24B *3/12*

U.S. Cl. 131—277 **2 Claims**

1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to smoking

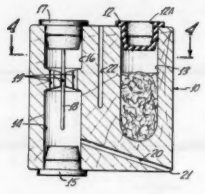
tobacco an organoleptic property augmenting or enhancing quantity of a cyclic chemical compound having the structure:





wherein Z is benzo or cyclohexano.

4,294,267
POCKET PIPE
Ronald C. Glymph, 11914 Wilmington Ave., Los Angeles, Calif. 90059
Filed Jun. 27, 1977, Ser. No. 810,636
Int. Cl.³ A24F *3/02, 7/00, 5/10, 5/12*
U.S. Cl. 131—330 **4 Claims**

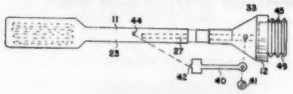


1. A smoking pipe comprising:
a unitary body;
first and second chambers in said body each communicating with an exterior surface of said body with an intervening portion of said body between said first and second chambers, said first chamber adapted to receive burning materials for smoking and said second chamber adapted to receive smoke and resin from said first chamber;
at least one aperture in said intervening portion communicating with each of said first and second chambers;
a channel in said body communicating with said second chamber and the exterior of said body to form a mouthpiece for said pipe;
a third chamber in said body communicating with an exterior surface of said body and separated from said first and second chambers, said third chamber providing means for storage of smoking materials;
removable caps for each of said chambers, at least one of said caps having a tine dependent therefrom for cleaning said aperture in said intervening portion;
said caps having a portion which engages the outer edge of its respective chamber to form a snug fit and a main body which extends from said snugly fitted portion into its chamber when its outer portion is in a snugly fitted relationship; and
at least one of said main bodies of said caps having a hollow portion therein for transferring smoking materials.

4,294,268
PEDICURE EASEL
John V. Kitrell, 4639 Holdrege, Lincoln, Nebr. 68503
Filed May 13, 1980, Ser. No. 149,320
Int. Cl.³ A45D *29/00*
U.S. Cl. 132—73 **9 Claims**

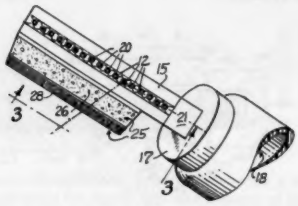
1. A pedicure easel, comprising,
a supporting means comprising first and second support means,
said first support means having a pair of ends,
one end of said first support means being adapted to be placed on a horizontal supporting surface,
said second support means having a pair of ends,
said second support means being secured, adjacent one end thereof, to said first support means adjacent the said other end thereof,
the other end of said second support means being adapted to be removably secured to a toilet bowl,
and a foot supporting plate mounted on said supporting means.

4,294,269
COMPACT TOOTHBRUSH KIT
Albert D. Kyte, P.O. Box 2523, Pensacola, Fla. 32503
Filed Jan. 31, 1977, Ser. No. 764,354
Int. Cl.³ A45D *44/18*
U.S. Cl. 132—84 B **3 Claims**



1. A toothbrush assembly which may be disassembled to fit into a container, comprising
a shank unit fitted at a first end with bristles and shaped at a second end to detachably engage a first cap,
a tubular housing threadably attachable at a first end to said first cap and fitted with an internal chamber open at one end of the housing of a size to contain a tube of dentifrice, and
a second cap threadably attachable to a second end of said housing, said second cap fitted with a chamber of a size to contain a reel of dental floss, said second cap formed with a through hole to permit a length of dental floss to extend through said second cap, in which
a member formed with a projecting cutting edge section, for cutting of dental floss, is externally mounted to the assembled housing, said member and cutting edge section being located within the confines of an open external recess in said assembled housing.

4,294,270
HAIR TREATING FLUID APPLICATOR
Loretta L. Cochran, 807 Corvallis Dr., Sunnyvale, Calif. 94087
Filed Sep. 19, 1977, Ser. No. 834,188
Int. Cl.³ A45D *24/22*
U.S. Cl. 132—112 **6 Claims**



1. An applicator for depositing and distributing a fluid onto the hair of a human being comprising:

(a) a fluid supply reservoir having an open end;

(b) a cap portion attached to said open end of said supply reservoir, said cap portion having a passage formed therethrough for communication with the interior of said supply reservoir;

(c) a fountain comb including a backbone secured to said cap portion and having a manifold passage in communication with the passage formed through said cap portion;

(d) A plurality of comb teeth extending in parallel relation to one another from the backbone of said comb and each having a passage formed lengthwise therethrough for communication with the manifold passage in said backbone;

(e) a bumper sponge on said backbone of said comb for absorbing and mopping excess fluid from the scalp and hair under treatment, said bumper sponge being disposed on one side of said backbone of said comb displaced in the vicinity of 90° degrees from the side of said backbone of said comb from which said comb teeth project and having an outer surface opposite the surface thereof on said backbone of said comb; and

(f) a brush on said outer surface of said sponge for spreading the fluid relative to strands and curls of hair under treatment, said brush having bristles extending laterally outward from the outer surface of said sponge for combined action with said sponge in spreading and distributing the fluid over hair under treatment.

4,294,271
APPARATUS FOR REMOVING DEPOSITED MATTER FROM A DIFFUSION TUBE
Josef Intrater, Englewood Cliffs, N.J.; Gene Bertholdo, New York, N.Y., and Janet Intrater, Englewood Cliffs, N.J., assignors to Dexon, Inc., Minneapolis, Minn.
Filed Nov. 30, 1979, Ser. No. 98,756
Int. Cl.³ B08B *3/02, 9/02*
U.S. Cl. 134—113 **28 Claims**

18. A spray head device for use in cleaning a diffusion tube of matter deposited therewithin comprising:

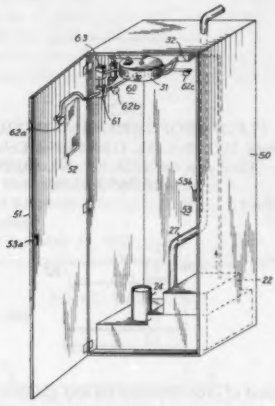
a body portion;

sealing means for sealably contacting an opening at one end of said tube;

spraying means for spraying a reagent against the inside surface of said tube;

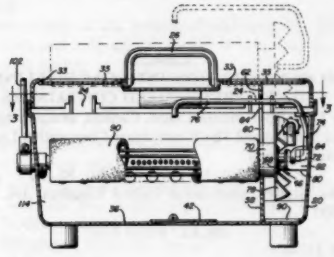
means for providing a flow of said reagent to said spraying means; and

means to prevent said reagent sprayed by said spraying means from forming channels in said deposited matter, said means to prevent including spray nozzles for spraying



the reagent circumferentially and longitudinally along the inside surface of said tube at said opening.

4,294,272
APPARATUS FOR WASHING, RINSING AND SPIN DRYING PAINT ROLLERS
William C. Klaiber, 601 York Rd., Fayetteville, N.C. 28303
Filed Oct. 11, 1979, Ser. No. 83,613
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—138 **12 Claims**



1. A paint roller cleaner including a receptacle for receiving a paint roller therein, elongated horizontal roller support means journalled within said receptacle for rotation about an axis extending longitudinally of said roller support means, said roller support means being adapted to have a paint roller sleeve lengthwise telescoped thereover for support therefrom and rotation therewith, an elongated horizontal water discharge manifold supported within said housing in horizontally laterally spaced relation relative to said roller support means, said manifold including water outlet jet discharge means spaced therealong and opening outwardly along one side of said manifold toward said roller support means, means operative to selectively supply water under pressure to the interior of said manifold, drive means, independent of said manifold water jet discharge means, operative to drive said roller support means, said receptacle including water outlet means operative to drain collected water in said receptacle from within the latter on one side of said roller support means down to a predetermined level spaced slightly below said axis of rotation of said roller support means, said drive means being operative to drive said roller support means in a direction of rotation of said roller

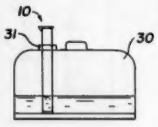
with the lower periphery of said roller support means being advanced toward the other side of said roller support means.

4,294,273

FLUID PROPORTIONING DEVICE

Gary J. Isberg, P.O. Box 491, Trail, British Columbia, Canada

Filed Jun. 18, 1979, Ser. No. 50,024
Int. Cl.³ B65D *87/00*
U.S. Cl. 137—1 **2 Claims**



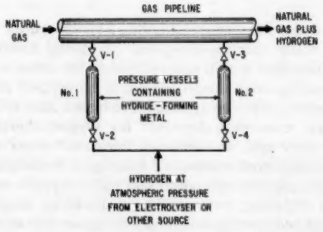
1. A method of proportioning oil and gasoline in a fuel tank comprising the steps of inserting into the partially filled fuel tank a tube having a volumetric capacity related to the volumetric capacity of the fuel tank by a ratio directly proportional to a prescribed ratio for mixing the gasoline and oil, admitting into and retaining within the tube a level of fuel equal to the level remaining in the fuel tank, removing the tube from the tank, adding oil to the tube to fill said tube to a predetermined level, and pouring the contents of the tube into the fuel tank before filling said tank with gasoline.

4,294,274

HYDROGEN INJECTION INTO GAS PIPELINES AND OTHER PRESSURIZED CONTAINERS

Rodney L. LeRoy, Pointe Claire, Canada, assignor to Noranda Mines Limited and The Electrolyser Corporation Ltd., both of Toronto, Canada

Filed Jul. 17, 1979, Ser. No. 58,306
Claims priority, application United Kingdom, Jul. 17, 1978, 30090/78
Int. Cl.³ F17D *1/02*
U.S. Cl. 137—7 **8 Claims**



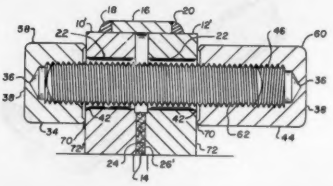
1. A method of introducing a proportion of hydrogen into a gas pipeline or other pressurized gas container, said method comprising feeding hydrogen into the container from a pressure source lower than the pressure of the gas in the container through a barrier freely permeable to hydrogen but impermeable to the gas in the container until the hydrogen partial pressure in the container becomes equal to the hydrogen pressure which is applied to the barrier.

4,294,275

FLANGED JOINT SEALING NUT

Mirrel L. Totman, McPherson, Kans., assignor to Totman Seal Nut, Inc., McPherson, Kans.

Filed Apr. 13, 1979, Ser. No. 29,679
Int. Cl.³ F16L *55/18*; F17D *3/00*
U.S. Cl. 137—15 **4 Claims**



4. An improved method of sealing a leaking flanged pipe joint comprising the steps of:

sealing the outer circumferential gap between the two adjacent flanges of the joint;

replacing the original bolts and nuts, one at a time, with a bolt and two closed-end nuts, the nuts having a means for sealing between the nuts and the flanges; and

threading the sealing nuts onto the bolt until both nuts contact the flanges, then tightening each nut until fully tightened, thus lastingly and positively sealing each nut to its adjacent flange;

in which the improvement comprises:

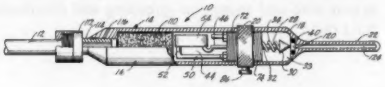
using full size sealing nuts and bolts equal in diameter to the original nuts and bolts, and locating the sealing area on the face of the flange near perimeter of the nut and away from rim of bolt hole.

4,294,276

WATER SENSITIVE PROBE VALVE FOR USE WITH A GAS LEAK DETECTOR

Loren C. Harrison, 8607 Danby Ave., Whittier, Calif. 90606

Filed Dec. 26, 1979, Ser. No. 107,151
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—67 **13 Claims**



1. An improved water sensitive probe valve comprising:

(a) a body defining an interior gas passage for the passage of gas through the probe valve;

(b) a coupling of the body and detachable from the balance thereof;

(c) a valve mounted on the coupling for closing the gas passage in a closed position of the valve, the valve being capable of translation along a path with respect to the coupling, the valve having a first finger extending radially of its path of translation;

(d) an anchor mounted on the coupling and defining a second finger extending radially of the path of translation of the valve;

(e) the first and second fingers defining mounting means for a water soluble link that keeps the valve in an open position;

(f) biasing means for urging the valve into the closed position and applying tension to the water soluble link;

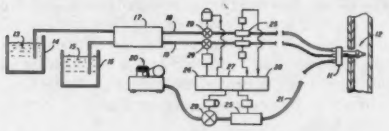
(g) a gas probe mounted on the body; and

(h) means for coupling the interior gas passage to a gas detector downstream of the valve.

4,294,277
FLOW CONTROL APPARATUS

Philip C. Szeliga, Utica, N.Y., assignor to Foam Controls, Inc., New Hartford, N.Y.

Filed Jul. 9, 1980, Ser. No. 167,127
Int. Cl.³ G05D *7/06, 11/13*
U.S. Cl. 137—101.19 **11 Claims**



1. A fluid control apparatus of the type wherein a plurality of fluids are delivered by means of a like number of lines to a mixing device, said apparatus including

a sensing means positioned in each line for developing a rate signal that is indicative of the flow passing through said line,

a comparator means operatively connected to each of the sensing means for comparing the rate signal of said sensing means with a selected rate and producing an upper control signal when the sensed rate is above the selected rate and a lower control signal when the sensed rate is below the selected rate,

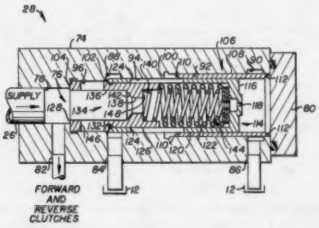
a control valve means contained in each of said lines that is responsive to said comparator means for increasing the flow rate in the line when a lower control signal is generated by said comparator means and for decreasing the flow rate when the upper control signal is generated by said comparator means, and

circuit means for monitoring the rate signals developed by each sensing means and for inhibiting the comparator means in the event all the rate signals fall simultaneously below a predetermined rate.

4,294,278
PRESSURE MODULATING VALVE

William W. Blake, Kewanee, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US79/01129, § 371 Date Dec. 14, 1979, § 102(e) Date Dec. 14, 1979, PCT Pub. No. WO81/01733, PCT Pub. Date Jun. 25, 1981
PCT Filed Dec. 14, 1979, Ser. No. 110,712
Int. Cl.³ F16K *11/10*
U.S. Cl. 137—115 **15 Claims**



1. In a modulating valve (**28**) having an axial passage (**76**), with a first end portion (**96**) and a second end portion (**92**), the improvement comprising:

a relief valve spool (**128**) mounted in said axial passage (**76**) adjacent the first end portion (**96**);

a load piston (**114**) mounted in said axial passage (**76**) adjacent the second end portion (**92**);

resilient means (**144**) for interconnecting said spool (**128**) and said load piston (**114**);

a pressure operated check valve means (**106**) for selectively relieving the pressure in said second end portion (**92**), which check valve means (**106**) is slidably mounted about said load piston (**114**);

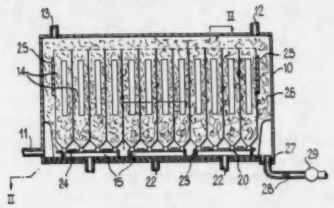
means (**124**) for communicating the first end piston (**96**) with the second end portion (**92**); and

means (**118**) for communicating the pressure operated check valve means (**106**) with the first end portion (**92**).

4,294,279
FUEL TANKS

Harold W. G. Wyeth, Fleet, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 31, 1979, Ser. No. 44,160
Claims priority, application United Kingdom, May 31, 1978, 24761/78
Int. Cl.³ B64D *37/08*
U.S. Cl. 137—264 **27 Claims**



1. A tank for liquid fuel and containing

a plurality of cells for containing fuel and each extending substantially from the floor of the tank to the ceiling thereof,

collection means, in the bottom of said tank, for collecting fuel from said cells and supplying it to at least one common tank outlet,

plug and socket means for mounting and detaining said cells in said tank and connecting said cells to said collection means, and

non-return valves preventing fluid flow from said collection means into said cells,

each of said cells being distinct and individually detachable from said tank and comprising an envelope of impermeable flexible material surrounding a resilient fire protective reticulated structure, said envelope being open at a top end thereof and having an outlet at the bottom thereof, and there being an ullage between the top of said cells and the roof of said tank, said ullage being substantially filled with at least one fire protective reticulated structure.

4,294,280
APPARATUS FOR PRODUCING AND DISPENSING DETERGENT SOLUTIONS

Milton D. Tom, R-1, Norwich, Ohio 43767

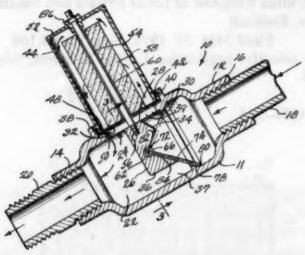
Filed Jul. 10, 1979, Ser. No. 56,309
Int. Cl.³ B05B *7/00*
U.S. Cl. 137—268 **7 Claims**

1. A device for selectively supplying a cleansing solution to a liquid conduit comprising:

a body having an interior chamber, inlet means for passing a liquid into said chamber, outlet means for discharging the liquid from said chamber, first aperture means in said body, and second aperture means in said body spaced from said first aperture means, housing means for a cleansing material, said housing means having an open end removably mounted on said body so as to completely surround said first and second aperture means.

said chamber having valve support means therein, a flap

valve movably carried by said valve support means so as to be movable between a first position, wherein liquid from said inlet means passes through said chamber to said outlet means, and a second position wherein liquid passes from said inlet means into a portion of said chamber and then through said first aperture means into said housing means, through said second aperture means back into said chamber and then to said outlet means, said second aperture means being disposed downstream of said valve support means and said flap valve so as to be in flow communication with said outlet means through said chamber when said flap valve is in either said first or second positions so that any liquid in said housing means will drain from said housing when said housing is located vertically above said chamber and said outlet means.



said valve support means including first wall means defining a first flow path and a portion of said chamber adjacent said first aperture means for directing liquid through said first aperture means into said housing means, and said valve support means including second wall means defining a second flow path in a portion of said chamber remote from said first aperture means and first flow path for directing liquid through said chamber to said outlet means.

4,294,281

RELIEF VALVE

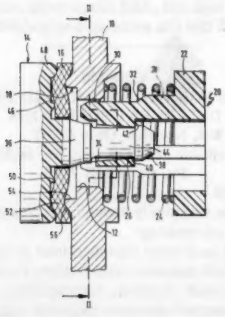
Theodor Gerdes, Langenfeld, Fed. Rep. of Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,543

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855290

Int. Cl.³ F16K *15/02*

U.S. Cl. 137—541 **6 Claims**



1. A relief valve having a wall with a valve aperture therethrough, a valve disc disposed on one side of the wall and adapted to cover the valve aperture, a sealing washer disposed on the valve disc for cooperation with a valve seat surrounding the valve aperture, a holding element moveably connected with the valve disc on the opposite side of said wall therefrom and extending into said valve aperture, a compression spring connected between the wall and a ring about the outer end of the holding element, said holding element having a hub extending into the valve aperture with radially projecting and axially extending parallel ribs circumferentially spaced about the exterior of said hub and formed integrally with said ring, said holding element at said ribs having a smaller diameter than the inside diameter of the valve aperture, and said valve disc and holding element being connected by a head, characterized by

said hub having a central axial opening therethrough of circular cross-section enlarging conically toward the valve disc,

said valve disc being comprised of an inelastic material having a valve stem extending from the disc into the opening of said hub with a diameter of the stem being equal to the smallest diameter of said hub opening and having a head on the stem with a greater diameter than the smallest diameter of said head opening for extension therethrough to bear upon the outer end of the hub.

4,294,282

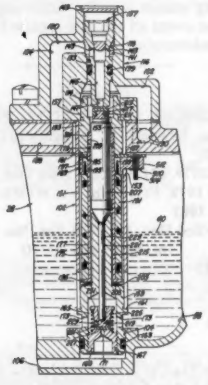
APPARATUS AND SYSTEM FOR CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A COMBUSTION ENGINE

Ralph P. McCabe, Troy, and Keith D. Marsh, St. Clair Shores, both of Mich., assignors to Colt Industries Operating Corp, New York, N.Y.

Filed Jul. 27, 1979, Ser. No. 61,428

Int. Cl.³ F16K *31/06, 11/14*

U.S. Cl. 137—595 **17 Claims**



1. A valving assembly for variably restricting fluid flow through first and second spaced flow orifice means, comprising housing means, said housing means comprising a first end member, a second end member, said first end member having a first portion for operative connection to associated structure, said second end member having a first portion for operative connection to associated structure, solenoid motor means, said solenoid motor means comprising axially extending spool means, said spool means comprising a generally centrally disposed tubular portion, a solenoid field winding carried by said spool means, axially extending armature means reciprocatingly situated in said tubular portion, a first opening formed through said first end member for permitting the free axial movement of said armature means therethrough, a second opening formed through said second end member for permitting the free axial movement of said armature means therethrough, a first valve member operatively connected to a first axial end of said armature means as to be effective to be juxtaposed to said first flow

orifice means, a second valve member operatively connected to a second axial end of said armature means opposite to said first axial end as to be effective to be juxtaposed to said second flow orifice means, said first and second valve members moving in unison with said armature means, resilient means effective for applying to said armature means only that resilient force tending to move said first valve member toward said first flow orifice means and said second valve member away from said second flow orifice means, and sleeve-like bushing means, said bushing means being carried within said first opening of said first end member and effective for slidably receiving said armature means.

4,294,283

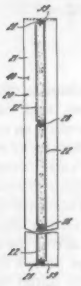
WEDGE SEALED DAMPER

Harry J. Scharres, 10 Gilbert Ave., Clarendon Hills, Ill. 60514

Continuation-in-part of Ser. No. 854,591, Nov. 25, 1977, abandoned. This application Nov. 19, 1979, Ser. No. 95,295

Int. Cl.³ F16K *11/14*

U.S. Cl. 137—601 **6 Claims**



1. A damper assembly comprising, in combination, a generally rectangular frame member including side, top and bottom members, a plurality of damper blades supported at opposite ends in the side member of the frame for limited rotative movement about axes extending longitudinally and substantially along the center line of the blades, a resilient sealing strip supported in each side frame member, the outer surfaces of said sealing strips being convex and extending beyond the interior surfaces of said side frame members, portions of each end of said blades being individually angled to be generally tangential to said convex surface of said sealing strip as said blade approaches the closed position, each of said angled blade end portions wedging against said sealing strip to create a seal when said blades move into the closed position, and said assembly further comprising two washers at each blade end to reduce friction between the ends of said blades and said resilient strips at the rotative axes of said blades.

4,294,284

FAIL-SAFE, NON-PRESSURE LOCKING GATE VALVE

David P. Herd, Kingwood, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 13, 1979, Ser. No. 93,612

Int. Cl.³ F16K *31/122, 3/00*

U.S. Cl. 137—613 **2 Claims**

1. A gate valve for operation on a submerged flowline comprising:

a valve housing having a valve chamber, a flow way intersecting said valve chamber, and a stem bore extending from said valve chamber;

a bonnet disposed on said valve housing having an actuator chamber and a bore extending from said actuator chamber into said valve chamber;

a closure member disposed on said valve housing having a bore extension coaxial with said stem bore;

a gate disposed in said valve chamber movable between an open position and a closed position, said gate having gate segments connected to first and second attached stems, said first stem extending through said bonnet bore and into said actuator chamber and said second attached stem extending into said stem bore;

a piston connected to said first attached stem and disposed in said actuator chamber for urging said gate between said open and closed positions;

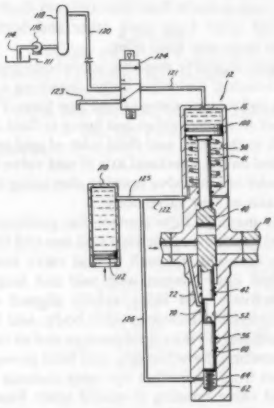
biasing means disposed in said actuator chamber engaging said piston for urging said gate from said open position to said closed position;

a detached stem disposed in said stem bore and extending into said bore extension and movable into engagement with said second attached stem;

seals around said first attached stem, around said second attached stem, and around said detached stem;

spring means disposed in said bore extension and engaging said detached stem;

port means extending from said flow way to said stem bore between said second attached stem and one end of said detached stem;



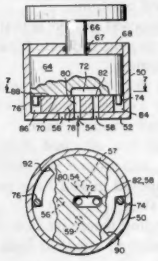
first means for supplying hydraulic fluid pressure and ambient sea pressure to one side of said piston, said first means applying a force on said piston to move said gate from said closed position to said open position where upon internal valve fluid is displaced from said stem bore through said port means as said second attached stem decreases the fluid volume in said stem bore and said second attached stem engages said detached stem to compress said spring means; and

second means for supplying ambient sea pressure to the other end of said detached stem in said bore extension and to the other side of said piston for applying an equivalent opposing force to the ambient sea pressure on said piston, said biasing means applying force to said piston to urge said gate from said open position to said closed position where upon the upstream line pressure assists said biasing means when the upstream line pressure is greater than ambient sea pressure and said detached stem engages said second attached stem when ambient sea pressure is greater than the upstream line pressure, said spring means urging said detached stem toward said second attached stem to overcome the frictional forces of said seals around said detached stem.

4,294,285
MULTI-PORT VALVE

Larry J. Joslyn, 720 Wilkinson Rd., Macedon, N.Y. 14502

Filed Dec. 14, 1978, Ser. No. 969,534
Int. Cl.[3] F17D *3/01*
U.S. Cl. 137—625.11 5 Claims



1. A multi-port valve comprising:

(a) a valve housing having an end wall containing at least three fluid outlets and a fluid inlet and said fluid outlets all being spaced apart from each other and being located equi-distant from said fluid inlet;

(b) a cylindrical, rotatably movable valve body positioned in said valve housing, said valve body containing a fluid inlet and a fluid outlet located in one end face thereof and being spaced apart from each other and being in fluid communication with each other, said fluid inlet of said valve body being located on the rotational axis of said valve body; and said fluid inlet of said valve housing also being located on rotational axis of said valve body;

(c) a rotatably movable flow control disc positioned in said housing and located intermediate said one end face of said valve body and said end wall of said valve housing and being in fluid tight contact with said end face and end wall, respectively, and being axially aligned with said cylindrical rotatably movable valve body, said flow control disc including an inlet fluid passage and an outlet fluid passage extending therethrough, said fluid passages being spaced apart from each other the same distance said fluid inlet of said valve housing is spaced apart from each of said fluid outlets of said valve housing, said fluid inlet passage being located on the rotational axis of said valve body and of said flow control disc and being in-line with and in fluid communication with both said fluid inlet of said valve housing and said fluid inlet of said valve body at all relative rotational positions of said valve body and said flow control disc;

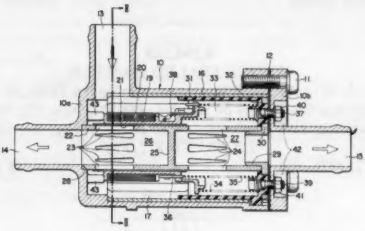
(d) means connected to said rotatably movable valve body for rotating said valve body relative to said valve housing and relative to said flow control disc, said valve body and said flow control disc cooperating with each other such that said body can move relative to said disc between a first position wherein said body fluid outlet is in fluid communication with said disc outlet passage, and a second position wherein said body fluid outlet is sealed from said disc outlet passage; and

(e) drive means cooperatively interengageable between said valve body and said flow control disc, after said valve body has moved to said second position, for rotatably moving said flow control disc together as a unit with said valve body and relative to said housing, as rotation of said valve body is continued, whereby said fluid outlet passage of said flow control disc can be placed in registry with a selected one of said housing fluid outlets, and the flow of fluid therefrom is accomplished only after said valve body is moved, relative to said disc, back to said first position to place said valve body fluid outlet, said disc outlet and said selected housing outlet into registry.

4,294,286
ELECTROMAGNETICALLY OPERABLE FLUID FLOW CONTROL VALVE MECHANISM

Takeharu Ohumi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 16, 1979, Ser. No. 39,592
Claims priority, application Japan, May 16, 1978, 53-58108
Int. Cl.[3] F16K *11/07, 31/08*
U.S. Cl. 137—625.48 4 Claims



1. A control valve mechanism comprising a casing having therewithin a valve means, said valve means comprising a linearly movable valve member, an electric motor means comprising a field and an armature to move linearly and operatively connected to the valve member, the electric motor means having a coil of electrically insulated wire surrounding the armature, and the field comprising a pair of arcuate permanent magnets disposed to form a circle surrounding the armature with a magnetic field across the coil, one inlet port, a first outlet port, a second outlet port, a first fluid path connecting the inlet port and the first outlet port, a second fluid path connecting the inlet port and the second outlet port, said valve means being commonly located on both of said fluid paths to control fluid communication therethrough, and spring means normally urging the valve member to a position in which the first fluid path is closed while the second fluid path is opened, the spring means comprising a pair of diametrically different coiled springs in concentric and electrically insulated relation with each other, said springs being respectively connected to both ends of said coil of wire of the armature to provide electric conductive means, wherein said valve means further comprises a tubular guide member, the valve member having a sliding fit on the tubular guide member, and the armature of the electric motor means being of tubular form and firmly surrounding the valve member to move together as a unit.

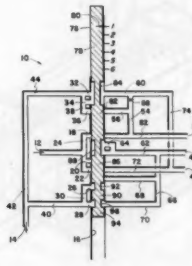
4,294,287
SHIFTING VALVE

William C. Boswell, 420 E. 2nd, Tulsa, Okla. 74120

Continuation of Ser. No. 945,398, Sep. 25, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 111,902
Int. Cl.[3] F15B *13/06*
U.S. Cl. 137—625.69 7 Claims

2. A shifting valve for a multiple position transmission having multiple modes of operation and comprising valve body means having a pressure fluid inlet and a pressure fluid outlet provided therein, both said fluid inlet and fluid outlet being in communication with a pressure fluid source to provide for circulation of pressure fluid to and from the pressure fluid source through the valve, a bore provided in the valve body means and in communication with the fluid inlet and fluid outlet, a unitary shifting element slidably disposed within said bore and movable between definite preselected positions therein, a first multi-passageway array provided in said valve body means providing said communication between the fluid inlet and the bore for directing the pressure fluid into the bore, second and third multi-passageway arrays provided in said valve body means providing said communication between the

bore and the fluid outlet for discharging pressure fluid from the bore, a plurality of independently isolated actuator outlets provided in the valve body means, each of said actuator outlets being in operable communication with the transmission for actuation thereof upon pressurization of the actuator outlets, a plurality of multi-passageway arrays provided in the valve body means interconnecting each actuator outlet with the bore whereby the pressure fluid may be selectively directed to and withdrawn from each actuator outlet upon the selective positioning of the shifting element within the bore, said shifting element being provided with a plurality of spaced lands and recesses on the outer periphery thereof cooperating with the



bore and the multi-passageway arrays for opening and closing the arrays whereby pressure fluid is directed to the actuator outlets in a manner providing a single operational mode for the transmission at a time and for withdrawing the pressure fluid from the actuator outlets which are not pressurized, said shifting element being movable to said definite preselected positions therefor for connecting each actuator outlet with the fluid inlet for pressurization of each actuator outlet in two separate preselected positions of the shifting element, each different pressurization of each independent actuator outlet providing pressure fluid to the transmission to produce differing modes of operation therefor.

4,294,288

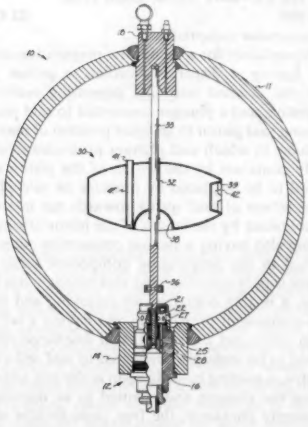
ACCUMULATOR WITH FLOAT ORIENTING MEANS

Rajam R. Murthy, Houston, Tex., assignor to Koomey, Inc., Houston, Tex.

Filed Feb. 25, 1980, Ser. No. 124,136

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **5 Claims**



1. In a guided-float accumulator comprising a vessel in the shape of a sphere or cylinder adapted to contain high fluid pressures, a mouth at the bottom of the vessel, fluid outlet means associated with the mouth for connection of the vessel and its content to a hydraulic system such as used in an oil well blowout preventer, a normally open shut-off valve associated with the mouth in series with the fluid outlet means, and a vented float movable in the vessel along transversely centered normally vertically extending guide means according to the level of the liquid fill within the vessel to thereby close off the shut-off valve and prevent the escape of pressurized gas from the ullage space of the vessel into the hydraulic system proper as the liquid fill within the vessel approaches exhaustion, the improvement which comprises provision of a vent outlet for the float and a ballast weight for the float with the vent outlet and ballast weight on opposite sides of the center of said normally vertically extending guide means, said float being mounted for free turning around said center whereby whatever the degree of liquid fill of the vessel, sidewise tilting of the vessel so as to move the normally vertically extending guide means toward a horizontal position will be accompanied by rotation of the vent outlet to the then-high side of said center of said normally vertically extending guide means to keep the vent outlet above the liquid fill and maintain the float directly vented to the ullage space of the vessel.

4,294,289

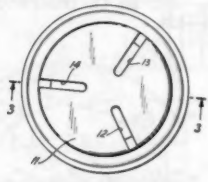
FLOW CONTROL DEVICE

Armin O. Fischer, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.

Filed Jan. 24, 1980, Ser. No. 114,818

Int. Cl.³ F15D *1/02*

U.S. Cl. 138—44 **2 Claims**



1. A flow restrictor comprising a disc having a recessed downstream side and a boss formed on the upstream side thereof to form a rim, the upstream surface of said boss being flat, said boss having at least one slot formed therein, the upstream opening of said slot having a respective width that is substantially smaller than the length of said opening, said width being very narrow to prevent foreign matter from entering said slot, said slot having sides within the device, said slot having an aperture formed therein to permit fluid communication between said upstream and downstream disc sides, said aperture at said downstream side being at no point narrower than the narrowest portion of said upstream slot width, and the upstream side of the slot having leading edges that are substantially longer than those of said aperture due to a portion of the slot being obstructed by said rim.

4,294,290

PROCESS AND LOOM FOR THE PRODUCTION OF PILE FABRICS

Erhard Freisler, Bubikon, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Switzerland

Filed Jun. 20, 1979, Ser. No. 50,167

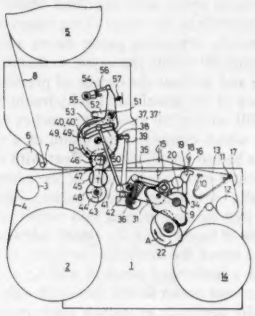
Claims priority, application Switzerland, Jun. 30, 1978, 7153/78

Int. Cl.³ D03D *39/22, 49/06*

U.S. Cl. 139—26 **21 Claims**

1. A process of producing pile fabric with pile or terry loops

of constant height, on a loom having a pile-warp beam, a ground-warp beam and a batten the stroke of which in operation is shortened periodically from the value corresponding to a full beating-up of the batten by a value for partial beatings



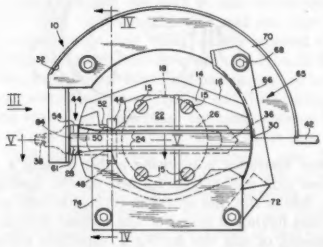
referred to as the pre-beating distance, characterized by the fact that during the weaving process the pre-beating distance is decreased or increased upon variations in the tension of the pile warp.

4,294,291

SHUTTLE RETAINING APPARATUS

Philip A. Nims, Charlotte, and Roger K. Bollinger, Gastonia, both of N.C., assignors to Crompton & Knowles Corporation, New York, N.Y.

Filed May 15, 1980, Ser. No. 150,273
Int. Cl.[3] D03D *47/24*
U.S. Cl. 139—438 **9 Claims**



1. Shuttle control apparatus for looms having a shuttle box rotatable 180° from a first position for allowing the shuttle to be picked out of the shuttle box, means for checking the shuttle when it enters the shuttle box, means for positioning the shuttle within the shuttle box to a predetermined picking position when the shuttle box is in its first position and means for picking the shuttle when the shuttle box is in its second position, said shuttle control apparatus comprising:

(a) means for guiding the shuttle as it moves from the first position to the second position to maintain the shuttle in said predetermined picking position within the shuttle box;

(b) a shuttle brake normally disposed in a non-braking mode and operable to a braking mode for engaging the shuttle and maintaining the shuttle in the predetermined picking position; and

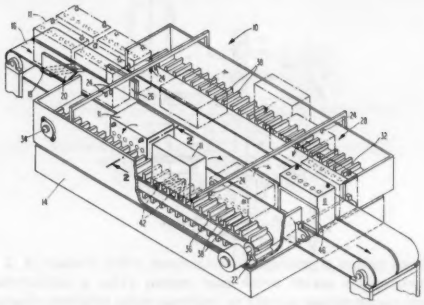
(c) brake actuating means for operating the shuttle brake to the braking mode when the shuttle box is in its second position, said actuating means being effective to cause the shuttle brake to apply a braking force to the shuttle which is sufficient to maintain the shuttle in said predetermined picking position and insufficient to prevent the shuttle from being picked.

4,294,292

TUMBLE DUMPER

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed Nov. 1, 1979, Ser. No. 90,477
Int. Cl.[3] B65B *21/08*
U.S. Cl. 141—1 **22 Claims**



9. The method of actively removing electrolyte from lead-acid storage batteries having filling holes defined in a top surface thereof comprising:

(a) carrying the batteries into an automatic apparatus;

(b) inverting said batteries over a receiver tank;

(c) jostling the batteries so that all of the electrolyte therein is actively removed; and

(d) righting the batteries so that they may be carried out of the machine for further processing.

4,294,293

METHOD OF MIXING COSMETIC MULTI-COMPONENT PREPARATIONS AND SET OF APPARATUS FOR THE PRACTICE OF THE METHOD

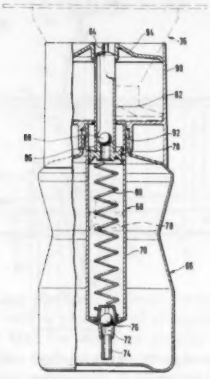
Heribert Lorenz, Gross-Bieberau, and Jürgen Tennigkeit, Seeheim, both of Fed. Rep. of Germany, assignors to Goldwell GmbH, Darmstadt-Eberstadt, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,035
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827610
Int. Cl.[3] B01F *15/02*; B65B *3/10*
U.S. Cl. 141—100 **21 Claims**

1. A set of apparatus comprising:

a first supply container for a liquid first preparation component and having a dispensing orifice, a piston pump adapted to be inserted into said dispensing orifice and having a piston, and a plunger connected to said piston, a spring biasing said piston to an outer position of maximum stroke volume in which said plunger protrudes from said first supply container by the length of the piston stroke and adapted to be displaced by pressure on said plunger against the action of said spring towards the interior of said first container by the length of the piston stroke, said piston pump also having a suction connection adapted to be immersed in the preparation component when contained in the supply container and also having a discharge connection, a mixing container for receiving and mixing of a multi-component preparation and having a self-closing bottom valve and a pedestal, said discharge connection adapted to be sealingly connected to said self-closing bottom valve, a guiding housing open at the top, annularly surrounding the plunger and adapted to be disposed on said first supply container, the free cross-section of said guide housing conforming to the outer cross-sectional dimensions of said pedestal and guiding the pedestal upon

the depression of the plunger, such that the discharge connection of the pump is adapted to be aligned with the bottom valve of the mixing container, a pressure container, a second supply container being disposed in said pressure container and being volume-variable and adapted to be filled with an additional paste or liquid preparation component, an external dispensing valve in communication with said second supply container, the capacity of said second supply container being smaller than the capacity of the pressure container, the space remaining between the second supply container and the inside walls of the pressure container being filled with a propellant under pressure, said dispensing valve being adapted to be sealingly connected to the bottom valve of said mixing container.

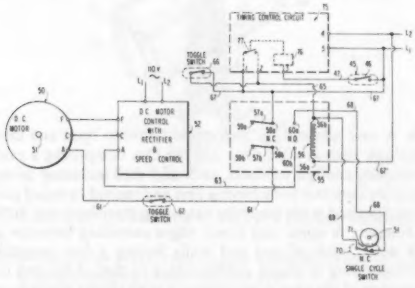


4,294,294

CONTROL SYSTEM FOR FILLING MACHINE

Richard N. Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Filed Feb. 7, 1980, Ser. No. 119,317
Int. Cl.³ B65B *43/56*
U.S. Cl. 141—179 **9 Claims**



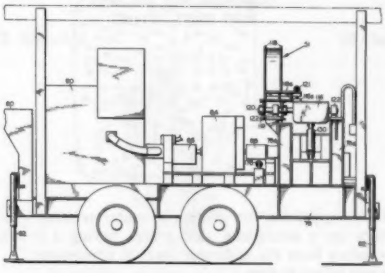
1. A control system for a filling machine having filling means operatively connected with nozzle means for simultaneously filling a number of containers corresponding to the number of nozzle means at the filling station, support means for the nozzle means operable to lower and raise the nozzle means into and out of the containers in timed relationship to the filling operation during a given cycle, and control means for controlling the operation of the filling machine including means for actuating the filling means to cause discharge of the product to be filled while the nozzle means are in the containers, means for selectively lowering and raising the nozzle support means in timed relationship to the operation of the filling machine, indexing means with star-wheel means for indexing a predetermined number of containers to be filled at the same time during a given cycle of operation, means for stopping the star-wheel means after a predetermined number of containers are indexed for a given filling operation, and release means for releasing the stop means after completion of a filling operation to permit the filled containers to be removed from the filling station and to permit a predetermined number of containers to be brought to the filling station before the star-wheel means is again stopped by said stop means, characterized by further means operated by movement of the star-wheel means after release thereof by said release means for taking over control of the operation of the filling machine until said star-wheel means again reaches a position thereof indicative of the arrival at the filling station of the predetermined number of containers to be filled during the next cycle of operation.

4,294,295

APPARATUS FOR CUTTING AND SPLITTING FIREWOOD

C. Howard Olin, Tigard, Oreg., assignor to Bloomfield Farms, Inc., Los Altos, Calif.

Filed Sep. 25, 1978, Ser. No. 945,464
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—3 K **14 Claims**



1. Firewood splitting apparatus, comprising:
(a) a frame,
(b) block splitter means on the frame,
(c) ram means on the frame arranged for axial movement toward and away from the splitter means for moving a block toward the splitter means, and
(d) block centering means on the frame comprising upper and lower centering pans arranged to receive a block between them and movable vertically to position the block between the splitter means and the ram means.

4,294,296

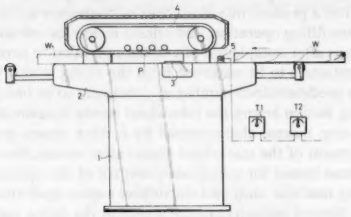
CARPENTER PLANER

Hirotsuga Onda, Seki, Japan, assignor to Onda Ironworks Company, Limited, Gifu, Japan

Filed Sep. 21, 1979, Ser. No. 78,312
Int. Cl.³ B27C *1/12*
U.S. Cl. 144—120 **6 Claims**

1. A carpenter planer comprising a planer base, a stock feeding table provided on the planer base, a stock feeding unit connected to and situated above the stock feeding table and spaced therefrom, said stock feeding unit having an endless belt and a reversible motor for rotating the endless belt back and forth, a planer blade situated in the stock feeding table and slightly projecting therefrom, detecting means for detecting passage of stock moved on the stock feeding table by the endless belt of the stock feeding unit, and timing means actu-

ated by said detecting means, said timing means controlling the motor so that after the stock is completely passed over the



planer blade, the motor is stopped and then the motor is reversely actuated to return the stock to a first position.

4,294,297

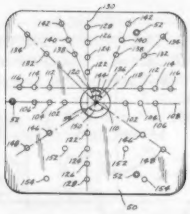
ROUTER GUIDE APPARATUS AND METHOD

Vincent C. Kieffer, 411 Highland Dr., Gretna, Nebr. 68028

Filed Apr. 11, 1979, Ser. No. 28,985

Int. Cl.³ B27C *5/10*

U.S. Cl. 144—134 D **18 Claims**



1. An apparatus for guiding a router relative to a guide surface on a workpiece, said router having a rotatable bit protruding from the underside thereof, comprising,

a pair of guide pins,

means for securing the guide pins to the underside of said router at positions spaced apart from one another and radially spaced from the bit,

said guide pins protruding from the underside of said router for continuous engagement with said guide surface as the router is advanced along the workpiece,

said means for securing the guide pins comprising a subbase plate having a tool opening and a plurality of guide pin openings adapted to receive said guide pins and means for securing said subbase plate to the underside of the router with said tool opening positioned for protrusion of said bit through the center thereof,

said guide pin openings including a plurality of pairs of guide pin holes aligned along a line disposed in nonintersecting relation to the center of said tool opening, the holes of each pair being equidistant from the point of intersection of said line and another line perpendicular thereto and passing through the center of said tool opening.

4,294,298

IMPACT CUTTING TOOL

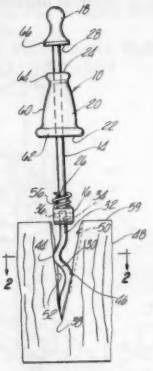
Otho M. Otte, Jr., 719 Avenue "A", Apt. 705 ID, Springfield, Mich. 49017

Filed Mar. 1, 1979, Ser. No. 16,392

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 C **12 Claims**

1. An impact tool for splitting logs comprising; an elongated guide member, a primary anvil formed at one end of said guide member, a hammer element mounted on said guide member for sliding movement on said guide member and having an impact surface engageable with said anvil, a tool supported from said anvil and extending generally axially of said guide member, said tool including a curved cutting edge in spaced relation of said anvil, wedge means formed by said tool between said anvil



and said cutting edge to engage wood and widen the split initiated by said cutting edge, said wedge means being formed by a tool portion disposed to one side of the axis of said guide member and having a guide surface conforming to the shape of said curved cutting edge and operable to engage and be guided by the wood path cut by said cutting edge.

4,294,299

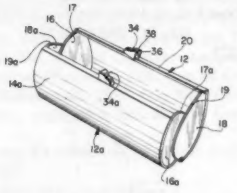
HANDBAG CONSTRUCTION

Mac Dorsen, Scarsdale, and Philip A. Saltzman, Brooklyn, both of N.Y., assignors to Stupell Industries, Ltd., Johnston, R.I.

Filed Feb. 12, 1980, Ser. No. 120,936

Int. Cl.³ A45C *3/06*

U.S. Cl. 150—28 R **9 Claims**



1. A case adapted for movement between open and closed positions, such as a handbag and the like, comprising a pair of identically configured shells, each said shell including an open inwardly concave body having first and second opposed parallel upright end walls inwardly extending therefrom and further terminating in upper and lower edges extending between said end walls, each of said end walls having a face essentially corresponding in planar configuration to that of the end configuration of the case when disposed in its closed position, said lower edges including inwardly extending hinge means defining a longitudinal hinge line, said shells adapted for connection with each other along said hinge line with said concave shell bodies opposed and pivotable away from and towards each other about said hinge line between said open and closed case positions, respectively, with the first end wall of one shell and the second end wall of the other shell overlapped in slidable, generally face to face contacting relationship with the first end wall of said one shell disposed inwardly of the second end wall of the other shell at one end of the case and the second end wall of said one shell disposed outwardly of the first end wall of the other shell at the other case end.

4,294,300
SELF-LOCKING FASTENER

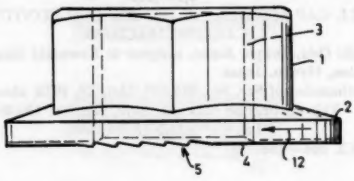
Johannes E. Bouwman, Helmond, Netherlands, assignor to Nedschroef Octrooi Maatschappij N.V., Helmond, Netherlands

Filed Jan. 9, 1979, Ser. No. 2,229

Claims priority, application Netherlands, Jan. 13, 1978, 7800432

Int. Cl.³ F16B *39/282*

U.S. Cl. 411—185 **5 Claims**



1. A self-locking threaded fastener having a planar rigid bearing surface with a plurality of elongated teeth thereon, characterized in that the teeth are located in a plurality of groups, in that the teeth in each group extend parallel with each other and to a tangent to the threads of the fastener, in that the height of the teeth are the same over the entire length of the teeth and in that the teeth extend above said bearing surface with the roots of the teeth being disposed below said surface.

4,294,301
VALVE CONSTRUCTION FOR TUBELESS TIRE

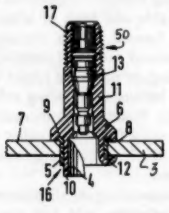
Sepp Lutz, Giengen, Fed. Rep. of Germany, assignor to Alligator Ventilfabrik GmbH, Fed. Rep. of Germany

Continuation of Ser. No. 819,991, Jul. 28, 1977, abandoned. This application Jan. 2, 1980, Ser. No. 109,073

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634153

Int. Cl.³ B60C *29/00*

U.S. Cl. 152—427 **5 Claims**



1. A valve for the bore in a tire rim of a tubeless tire comprising:

a tubular metal valve body having a passage communicating with the interior of the tubeless tire;

a valve core movable in the passage to block a flow of air therethrough out of the interior of the tubeless tire;

said valve body having, a rim surface engagement flange extending radially outwardly of the rim bore and bearing on one side of the rim adjacent the rim bore for fixing said valve body in one direction in the rim bore, a deformable tubular portion permanently deformed from an axial position to a radially outwardly extending position and bearing on an opposite side of the rim adjacent the bore to fix the valve body in an opposite direction, and a sleeve extending through the bore and connecting said deformed tubular portion and said engagement flange, the spacing between said flange and said deformed tubular portion being approximately equal to the length of the rim bore;

said deformed tubular portion comprising an initially annular tubular portion extending axially with a remainder of said valve body which is deformed downwardly against an outer surface of the rim adjacent the rim bore; and

a soft material lining the outer diameter of which is initially approximately equal in diameter to the diameter of the rim bore, disposed and compressed between the rim bore and said valve body sleeve for establishing an air-tight seal between said valve body and the rim, ends of said soft material lining at opposite ends of the rim bore being bent over by said flange and said deformed tubular portion and pressed into engagement with the one and the opposite side of the rim adjacent the rim bore.

4,294,302
SHUTTER AND AWNING DEVICE

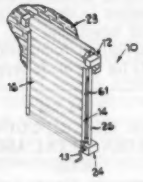
Cyril T. Ricke, Sr., Itasca, Ill., assignor to Security Shutter Corp., Venice, Fla.

Continuation of Ser. No. 528,482, Nov. 29, 1974, abandoned, which is a continuation of Ser. No. 313,563, Dec. 13, 1972, abandoned. This application Aug. 14, 1980, Ser. No. 178,038

The portion of the term of this patent subsequent to Aug. 13, 1993, has been disclaimed.

Int. Cl.³ E06B *9/08*

U.S. Cl. 160—133 **10 Claims**



1. A protective shutter device for an opening in a wall or the like comprising an articulated curtain made of a plurality of identical interlocked elongated rigid slats each assembled hingedly relative to an adjoining slat and each having a rod-like integral projection extending along an edge thereof and a socket-like integral portion extending along the other edge thereof whereby said plurality of slats are assembled together by sliding the rod-like projection along an edge of a slat through the socket-like edge portion of another slat, a pair of guide frame members each mounted on one side of said articulated curtain and having a groove slidably receiving an end of each of said slats, and a drive mechanism for raising and lowering said articulated curtain, said drive mechanism comprising a shaft having an axis of rotation disposed substantially parallel to the longitudinal axis of said slats, means rotatably supporting said shaft at the top of said opening, at least a pair of lugs mounted on said shaft and extending radially from said shaft, means attaching one of said slats disposed at an end of said articulated curtain to one of said lugs whereby rotation of said shaft in one direction causes said articulated curtain to be raised and said slats to be wound around said shaft in spaced apart relationship from said shaft, gear drive means driving said shaft in said one direction for raising said articulated curtain and in an opposite direction for lowering said articulated curtain, and gear drive locking means for controllably locking said gear drive means against rotation when not in operation for raising and lowering said articulated curtain.

4,294,303
SAND CORE PATTERN AND METHOD OF FORMING A SAND MOLD

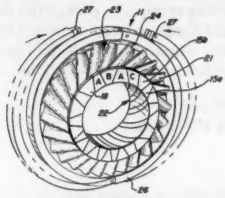
Edward E. Flesburg, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US80/00268, § 371 Date Mar. 13, 1980, § 102(e) Date Mar. 13, 1980, Pub. No. WO81/02536, Pub. Date Sep. 17, 1981

PCT Filed Mar. 13, 1980, Ser. No. 195,719

Int. Cl.³ B22C *7/00, 9/02*

U.S. Cl. 164—44 **30 Claims**



1. A reusable pattern **(11)** for forming a sand mold for casting a one-piece wheel **(10)** having a radially inner, annular shell **(12)**, a coaxial radially outer, annular blade support **(13)** and a plurality of angled blades **(14)** extending in a spaced annular array **(22)** between said shell and blade support to define a fluid flow deflector, said pattern comprising:

a plurality of segments **(15)** each having a first end portion **(18)** defining a segmentally annular portion of the profile of the shell, and a second end portion **(21)** defining the profile of a single blade;

means **(25)** for supporting the segments in an annular array **(22)** to cause said segments to define cumulatively a pattern structure corresponding to the annular shell configuration and the blade of said wheel; and

a removable outer ring **(26)** encircling said array of segments to define a pattern **(11)** for the blade support **(13)**.

4,294,304
ELECTROMAGNETIC CENTRIFUGING INDUCTOR FOR ROTATING A MOLTEN METAL ABOUT ITS CASTING AXIS

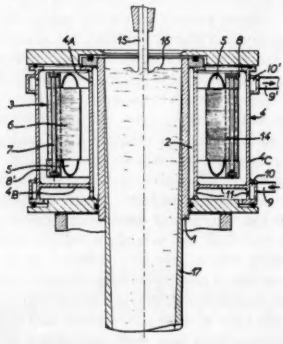
Jean Delassus, Montmorency, France, assignor to CEM - Compagnie Electro-Mecanique, Paris, France

Filed May 31, 1977, Ser. No. 802,128

Claims priority, application France, Jun. 14, 1976, 76 17919

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—504 **2 Claims**



1. Apparatus for producing rotation of a molten metal body about its axis while it is being cast to create a centrifuging effect comprising a casting conduit, an annular tank filled with a fluid coolant surrounding said casting conduit, an annular electromagnetic centrifuging inductor structure mounted within said tank, said inductor structure comprising an annular core body of a magnetic material provided with six uniformly circumferentially spaced teeth projecting in a radially inward direction towards a center coincident with the casting axis, arcuate coils mounted respectively on each of said teeth for energization from a three-phase a.c. source, there being two coils provided for each phase which are mounted on two diametrically opposite teeth and are electrically connected such that their generated magnetic fluxes are additive and bi-polar.

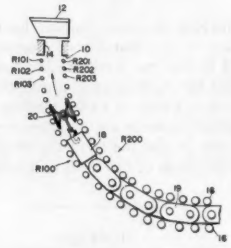
4,294,305
ROLL GAP MEASURING DEVICE FOR CONTINUOUS CASTING MACHINE

Kenichi Oda, Tokyo, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

Continuation of Ser. No. 954,437, Oct. 25, 1978, abandoned. This application Mar. 14, 1980, Ser. No. 130,465

Int. Cl.³ B22D *11/00, 2/00*

U.S. Cl. 164—150 **8 Claims**



1. A roll gap measuring device for continuous casting machines wherein said measuring device comprises:

guide means travelling between facing rolls of the continuous casting machine, said guide means comprising a pair of opposing skids and leaf springs coupled to said skids biasing said skids in contact with facing rolls;

at least one leaf coupling said guide means to a dummy bar head;

a pair of measuring elements supported by said guide means relatively movable and both of which having outer end surfaces each formed into a circular arc, the distance between the central points of outer end surfaces of each pair of measuring elements is a preset value approximately equal to a gap between the facing rolls;

biasing means for biasing said measuring element in the direction separating from each other so as to bring them into contact with the outer peripheries of separate rolls, respectively; and

a transducer for measuring the displacement of said measuring elements, whereby said roll gap measuring device, travelling between said rolls, measures the gaps.

4,294,306
WITHDRAWAL ROLL UNIT FOR HORIZONTAL CONTINUOUS BILLET CASTING MACHINES

Alexandr D. Berenov, ulitsa Krasnykh Bortsov, 7-a, kv. 18; Vladislav P. Krainev, ulitsa Lunacharskogo, 210-a, kv. 24; Midkhat M. Mansurov, ulitsa Izbiratelei, 7, kv. 23; Vitaly M. Niskovskikh, ulitsa Kultury, 8, kv. 8, and Evgeny L. Silin, ulitsa Kultury, 22, kv. 9, all of Sverdlovsk, U.S.S.R.

Filed Sep. 14, 1979, Ser. No. 75,712

Int. Cl.³ B22D *11/00, 29/00;* **B65G** *13/11*

U.S. Cl. 164—448 **2 Claims**

1. A roll unit for withdrawing billets from a horizontal continuous billet casting machine comprising:

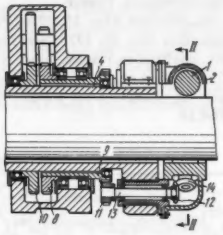
a cage rotatable about an axis of a billet being withdrawn;

means operative during withdrawal of a billet for associated with said cage and being rotating said cage about said axis;

a plurality of withdrawal rolls having coplanar axes of rotation located in a plane perpendicular to said billet axis;

means associated with said rollers for driving said rollers;

a plurality of housings, each of said housings at least partially encompassing and rotatably supporting ends of one of said withdrawal rolls;



means associated with said cage and housings for connecting corresponding first ends of each of said housings to said cage; and

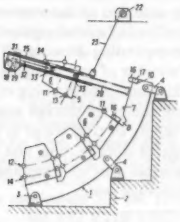
means comprising an elastic element associated with each of said housings for connecting confronting ends of said housings in series one to another to form a closed system about the axis of the billet.

4,294,307

SUPPORTING AND GUIDING STAND ARRANGEMENT TO BE USED IN A BOW-TYPE CONTINUOUS CASTING PLANT

Horst Wiesinger, and Werner Scheurecker, both of Linz, Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Feb. 4, 1980, Ser. No. 118,657
Claims priority, application Austria, Mar. 8, 1979, 1762/79
Int. Cl.³ B22D *11/128*
U.S. Cl. 164—448 **7 Claims**



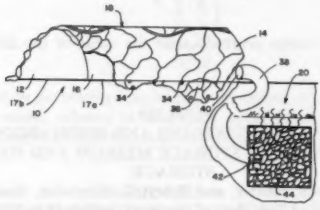
1. In a supporting and guiding stand arrangement to be used in a bow-type continuous casting plant and of the type including a carrying frame, a plurality of exchangeable supporting segments arranged along a circular arc and supported on said carrying frame, and strand guiding means with an outer guideway and an inner guideway arranged opposite each other and formed by rollers arranged at a distance from one another, which rollers are mounted in said supporting segments, a pivoting lever including means for seizing and extracting individual supporting segments mounted in the center of said circular arc, the length of said pivoting lever being shorter than the radial distance from the center to the supporting segments, the improvement which comprises telescopically extendable and retractable guide rails provided on said pivoting lever, means for moving said guide rails to and from a position adjacent said strand guiding means whereby said guide rails are disposed for engaging a supporting segment in a fork-like manner after having been extended and thus moved into the strand guiding means, counter guides being fastened on the supporting segment, said counter guides coming into engagement with said guide rails during their extension, said seizing and extracting means adapted to seize the respective supporting segment and move it along said guide rails from its installed position to its extracted position.

4,294,308

METHOD AND ASSEMBLY FOR CAMOUFLAGING AT LEAST ONE BUILDING

Joseph Spanier, and Florence Spanier, both of 27 Indian Rock Ct., San Anselmo, Calif. 94960

Filed Feb. 9, 1979, Ser. No. 10,889
Int. Cl.³ F24H *3/00*; B64F *1/00*
U.S. Cl. 165—1 **7 Claims**



1. In a technique for camouflaging a building containing a heat generating apparatus therein, an arrangement for preventing discovery of said building as a result of the heat generated by said apparatus, said arrangement comprising means including a passageway for diverting said heat from said apparatus within said building to a remote location, said passageway extending from said building to said remote location, at least a substantial section of said passageway being thermally insulated sufficient to prevent heat within said passageway section generated by said apparatus from being detected above ground level.

4,294,309

METHOD OF CONTROLLING THE HEATING OF A CHAMBER AND A CONTROLLED CHAMBER-HEATING INSTALLATION

Pierre Godard, Tremblay les Gonesse, and Michel Billot, Drancy, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Nov. 5, 1979, Ser. No. 91,100
Claims priority, application France, Nov. 16, 1978, 78 32373
Int. Cl.³ F24D *11/00*
U.S. Cl. 165—18 **3 Claims**

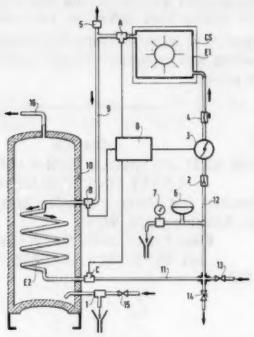
1. A method for controlling the heating of at least one heat storage chamber by means of a heat-conveying fluid, the method comprising:

providing a fluid circuit which includes a heat source, a heat storage chamber and controllable means for ensuring the circulation of a heat-conveying fluid from the heat source and through the heat storage chamber;

sensing the temperature t_A of the heat-conveying fluid at its outlet from the heat source, the temperature t_B of the heat-conveying fluid at its inlet to the heat storage chamber, and the temperature t_C of the heat-conveying fluid at its outlet from the heat storage chamber; and

controlling said controllable means to ensure that the heat-conveying fluid circulates from the heat source and through the heat storage chamber when t_A is greater than t_B+Dt, and that the fluid stops circulating, at least

through the heat storage chamber, when t_A is less than t_B+Dt, where Dt is a temperature offset having a value



which varies inversely with the value of the difference t_B-t_C.

4,294,310

METHOD FOR CHARGING AND DISCHARGING A LATENT-HEAT STORAGE MEDIUM AND HEAT STORAGE

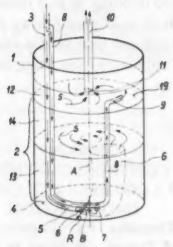
Heinz Reusch, Höxter, and Robert Kreikenbohm, Stadtoldendorf, both of Fed. Rep. of Germany, assignors to Stiebel Eltron GmbH & Co. KG, Holzmindel, Fed. Rep. of Germany

Filed Oct. 6, 1978, Ser. No. 949,026

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1977, 2745492; Jul. 17, 1978, 2831325

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—104.13 **7 Claims**



1. Heat storage unit for charging and discharging a latent-heat storage medium by a heat carrier liquid not miscible with it and flowing through the storage medium from the bottom upwardly and collecting on top, comprising: a latent-heat storage medium accommodated in a container, conduit means carrying heat carrier liquid and discharging at the bottom into the container, said container comprising a cylinder with a vertical axis, said conduit means having an exit nozzle located outside the axial center of said container and with an exit direction substantially in a horizontal direction and substantially perpendicular to the radius of the container, said conduit means conducting said heat carrier liquid and charging and discharging said container, the heat carrier liquid being introduced in such a direction and through such an entry cross section into said storage medium that in the melt of the storage medium a flow with a horizontal flow component is built up and the melt is set into a rotary motion by the horizontal flow component, rotary motion of the melt being set by the flowing motion of said heat carrier liquid, at least two conduits being provided with exit nozzles, and a sheet metal deflector arranged ahead of said exit nozzles.

4,294,311

METHOD OF AND ARRANGEMENT FOR THE SEASONAL STORAGE AND USE OF HOT WATER PRODUCED IN PARTICULAR BY ELECTRICAL POWER-GENERATING THERMAL AND NUCLEAR STATIONS

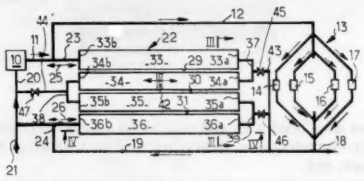
Louis H. D. Denis, Puteaux-Bellini; Abel J. H. Bedue, Versailles, and Jacques Malherbaud, Chatou, all of France, assignors to Compagnie Francaise d'Etudes et de Construction Technip, Rueil-Malmaison, France

Division of Ser. No. 668,000, Mar. 18, 1976, Pat. No. 4,159,736. This application Oct. 20, 1978, Ser. No. 952,944

Claims priority, application France, Mar. 20, 1975, 75 08747; Jun. 19, 1975, 75 19253; Aug. 27, 1975, 75 26419

Int. Cl.³ F28D *13/00;* **F24H** *7/00*

U.S. Cl. 165—104.14 **32 Claims**



1. A large-capacity tank for seasonal storage of hot water, produced for example by electric power generating thermal and nuclear stations, and for their seasonal use, for example for the heating of buildings, comprising:

a basin of large surface area;

partition walls provided in said basin dividing said basin into a plurality of distinct elongated storage zones, each elongated storage zone having two separated ends;

first means coupled to one end of each of said elongated storage zones for supplying and recovering hot water stored in said elongated storage zones;

second means coupled to the other end of each of said elongated storage zones for supplying and recovering cold water stored in said elongated storage zones; and

means coupled to said first and second means for controlling the flows of water such that an instantaneous supply of hot water at one end of one of said elongated storage zones is balanced by a corresponding drawing off of cold water at the other end of another of said elongated storage zones, and such that an instantaneous drawing off of hot water at one end of said one elongated storage zone is balanced by a corresponding supply of cold water at the other end of said another elongated storage zone, said one and another elongated storage zones providing together a substantially constant body of storage water.

4,294,312

TUBE-BUNDLE HEAT EXCHANGER FOR COOLING A MEDIUM HAVING A HIGH INLET TEMPERATURE

Wolfgang Kehrer, and Helmut Lachmann, both of Berlin, Fed. Rep. of Germany, assignors to Borsig GmbH, Berlin, Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,327

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945844

Int. Cl.³ F28F *9/22*

U.S. Cl. 165—134 R **4 Claims**

1. A tube-bundle heat exchanger, for cooling a medium having a high inlet temperature, which comprises:

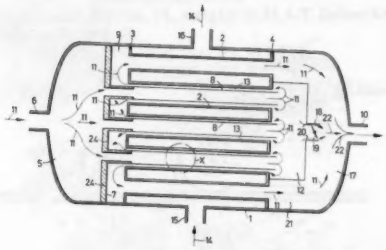
a shell having an inlet, inlet chamber, and outlet for said medium to be cooled, an inlet and outlet for cooling medium, and a reversing chamber, for medium to be cooled, at that end of said shell remote from said inlet chamber;

an inlet tube bottom and an outlet tube bottom supported at least in part by said shell;

a plurality of tubes, the ends of which are respectively fastened to and connect said inlet and outlet tube bottoms, said medium to be cooled flowing through said tubes;

an intermediate tube bottom supported at least in part by said shell and located in said inlet chamber in such a way as to form an intermediate chamber between said inlet tube bottom and said intermediate tube bottom; and

insert tubes respectively connected to said intermediate tube bottom and located concentrically in at least some of said tubes and projecting out on both sides from respective tubes, those ends of said insert tubes remote from said inlet chamber being sealingly covered by said reversing chamber, said insert tubes being spaced from respective tubes to



form annular spaces therebetween, said annular spaces, toward said inlet chamber, opening into said intermediate chamber, and, in the opposite direction, opening into said reversing chamber;

only those tubes located in a concentric circle with respect to the cross section of said shell including insert tubes, and said shell including an outlet chamber, for cooled-off medium, which concentrically surrounds said reversing chamber in such a way that an annular chamber of circular cross section is formed around said reversing chamber between it and said shell, those tubes present in said annular chamber externally of said reversing chamber not including insert tubes and having a direct connection between said intermediate chamber and said outlet chamber with said outlet for cooled-off medium.

4,294,313

KICKOVER TOOL

Harry E. Schwegman, deceased, late of Dallas County, Tex. (by M. J. Whitfield for First National Bank in Dallas, executor), assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 384,520, Aug. 1, 1973, abandoned. This application Jul. 24, 1974, Ser. No. 490,557

Int. Cl.³ E21B *43/12*

U.S. Cl. 166—117.5 **74 Claims**

1. A kickover tool for installing a device in the side pocket of a side pocket mandrel in a well tubing having a shoulder therein, comprising:

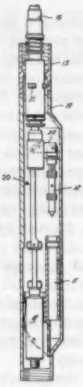
an elongated body;

actuator means arranged in telescopic relationship with said body and movable longitudinally relative thereto;

pivot arm means carried by one and positively connected to the other of said body and said actuator means and movable from a retracted position of longitudinal alignment with said body to an extended position laterally outwardly of said body upon relative longitudinal movement between said body and said actuator means;

releasable latching means initially engageable with said actuator means and said body means for preventing relative longitudinal movement between said body and said actuator means; and

means on said body operatively associated with said releasable latching means and engageable with a shoulder in said tubing for moving said releasable latching means to a



position permitting longitudinal movement of said actuator means relative to said body upon relative upward movement of said kickover tool in said tubing.

4,294,314

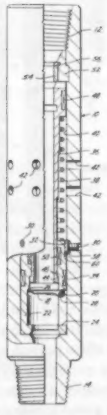
INSIDE BJ OWOUT PREVENTER WELL TOOL

Tosh Miyagishima; Joseph Puntar, and Raymond Wieveg, all of Los Angeles, Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed Dec. 31, 1979, Ser. No. 108,384

Int. Cl.³ E21B *43/00*; F16K *31/63*

U.S. Cl. 166—318 **4 Claims**



1. An inside blowout preventer well tool, comprising:

an elongated body threaded at both ends for securing in a conduit when desired and including an axial opening extending through said body;

a flapper pivotally mounted on a side of said axial opening movable between a lower-open position and an upper-closed position;

a downwardly-facing valve seat around the opening, the flapper engaging the seat in a flow sealing relationship in the upper-closed position for blocking fluid flow;

spring means for urging the flapper toward the seat, a piston movably disposed in said opening between an upper position where the lower end of the piston is above the valve

seat and a lower position where the piston operably engages the flapper and holds it in the lower-open position;

urging means for normally urging the piston toward its upper position;

said piston being arranged pressure responsive in order that when the internal pressure of drilling mud normally circulating through the opening is greater by a predetermined amount than pressure outside the body the pressure differential will overcome the force of the urging means and move the piston to the lower position, said piston responsive to fluid pressure outside said body for moving said piston to its upper position when the pressure differential is reduced by a predetermined amount;

a hollow cage rigidly mounted in said axial opening, said flapper being pivotally mounted on said cage and the valve seat being formed around the inner surface of the cage.

an outer surface of the cage includes an upwardly-facing shoulder and the inner wall of the body includes a groove coextensive with the shoulder, and a retaining ring in the groove engaging the upper side of the groove and the shoulder for restraining upward movement of the cage, relative to the body; and

the ring is split and the groove is at least as deep as the width of the ring so that at least a portion of the cage can be inserted below the groove without contacting the ring, a plurality of set screws moving the ring inwardly against the cage to engage the shoulder.

4,294,315

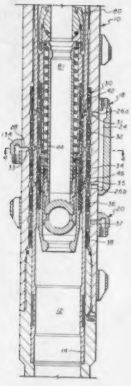
LANDING NIPPLE

John H. Yonker; Ernest P. Fisher, Jr., both of Carrollton, Tex., and David Bills, Baldrack, England, assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 13, 1978, Ser. No. 960,169

Int. Cl.[3] E21B *43/12*; F16K *3/00*

U.S. Cl. 166—322 **12 Claims**



1. A landing nipple adapted to be made up in a tubing string comprising:

a tubular member having a bore extending axially therethrough adapted for receiving a flow control device in said bore,

said tubular member having exterior means for receiving balance and control pressure fluids and means for communicating said fluids from the said exterior to the interior thereof,

said means for communicating control pressure fluid being separated from well fluid pressure conducted through said tubing string by said means for communicating balance pressure fluid and seals therebetween, and

additional seal means between said balance pressure fluid communicating means and said well fluid pressure conducted through said tubing string, whereby failure of said additional seal means causes said well fluid pressure to invade said balance pressure fluid communicating means rather than said control pressure communicating means.

4,294,316

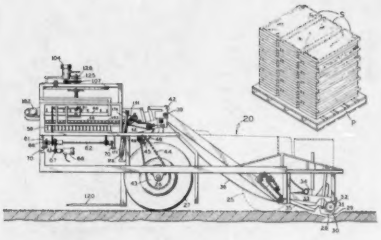
SOD CUTTING AND STACKING MACHINE

Victor H. Hedley, 5050 SW. 70th Ave., Ft. Lauderdale, Fla. 33314, and Walter A. Olson, 510 Grapefruit St., (Apt. 4B), Sebring, Fla. 33870

Filed Apr. 25, 1980, Ser. No. 143,788

Int. Cl.[3] A01B *45/04*

U.S. Cl. 172—20 **21 Claims**



1. In a sod cutting machine having;

means for peeling parallel strips of sod from the ground simultaneously;

means providing a horizontal support in the machine;

means for conveying the strips of sod upward from the ground to said horizontal support means;

means for cutting the strips of sod transversely into pieces which are deposited on said horizontal support means;

transfer means for picking the pieces of sod off said horizontal support means and carrying said pieces to a stacking location at one side of said support means;

and means for actuating said transfer means to release the sod pieces to drop by gravity into respective stacks when said transfer means is at said stacking location;

the improvement which comprises:

means for controlling said transfer means to maintain the same orientation of the sod pieces during successive operations of said transfer means;

and means for periodically varying the timing of the release of sod pieces during different operations of said transfer means to thereby produce a lateral overlap between neighboring stacks of sod pieces.

21. In a sod cutting machine having:

means for peeling parallel strips of sod from the ground simultaneously;

means providing a horizontal support in the machine;

conveyor belt means extending upward and rearward from said peeling means, and driving means for moving said conveyor belt means to convey the strips of sod upward and rearward from the ground;

cutting means located between the rear end of said conveyor belt means and said horizontal support means for cutting the strips of sod transversely into pieces which are deposited on said support means;

transfer means for picking the pieces of sod off said horizontal support means and carrying said pieces to a stacking location at one side of said support means;

and means for actuating said transfer means to release the sod pieces to drop by gravity into respective stacks when said transfer means is at said stacking location;

the improvement which comprises:

means for holding said strips of sod on said conveyor belt means at the latter's rear end and preventing said strips of

sod from continuing to move onto said horizontal support means while said cutting means cuts the sod into pieces;

and wherein:

said horizontal support means comprises a plurality of horizontal rollers extending transversely of the machine and spaced apart longitudinally of the machine;

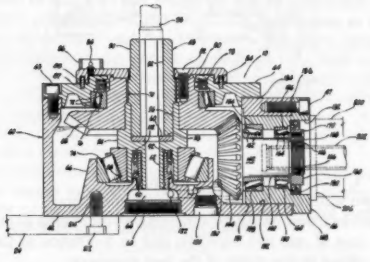
and said transfer means includes a vertically reciprocable horizontal platform below said rollers and vertical fingers extending up from said platform between the rollers to engage the sod pieces from below and lift them off the rollers when said platform is raised, said platform being operatively coupled to said cutting means to cause the latter to cut the strips of sod when the platform is raised.

4,294,317

DRILLHEAD UNIT

Michael J. Amoroso, Marion, Ill., assignor to M.A.T. Industries, Inc., West Frankford, Ill.

Filed Oct. 16, 1978, Ser. No. 951,747
Int. Cl.³ E21C 7/02
U.S. Cl. 173—57 **7 Claims**



1. A drillhead unit for transmitting power from a motor to a hollow drill bit, the unit comprising:

(a) a housing including an inner passage portion,

(b) a gear assembly received by the housing and having a longitudinal axis of rotation, said assembly including:

(1) a shaft having an outer bit-receiving end, and an inner end disposed within the housing remote from said outer end and including an annular transverse bearing face disposed inwardly of the shaft outside diameter, and an axial passage extending between said outer and inner ends and connected to the inner passage portion of the housing, and

(2) a gear disposed between said inner and outer ends of the shaft and connected to said shaft for rotation therewith,

(c) means for mounting the gear assembly to the housing including:

(1) bearing means operatively disposed in coaxial relation between the gear assembly and the housing, and

(2) pressure sealing means disposed between the gear assembly and the housing for separating at least the bearing means from the inner passage portion of the housing, said sealing means including:

(1) a coaxial element non-rotatively attached to the housing and including a transverse bearing face spaced from the transverse bearing face of the shaft, and

(2) a longitudinal resilient seal mounted between said spaced transverse bearing surfaces within the housing,

(d) a pinion assembly received by the housing and having an axis of rotation disposed transversely of the axis of rotation of the gear assembly, said pinion assembly including:

(1) a shaft having an outer end connected to the motor and an inner end remote from said outer end, and

(2) a pinion disposed at the inner end of said shaft and connected to said shaft for rotation therewith said pinion being engageable with the gear of said gear assembly in drive relation thereto,

(e) means for mounting the pinion assembly to the housing including:

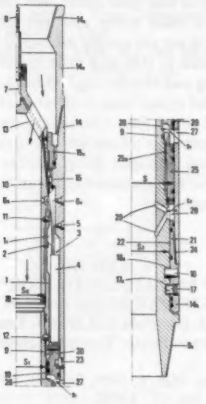
(1) bearing means operatively disposed in coaxial relation between the pinion assembly and the housing.

4,294,318

DEVICE FOR MEASURING THE STRESSES APPLIED IN USE TO THE DOWNHOLE ASSEMBLY OF A DRILL PIPE

Robert Desbrandes, Sevres, and Pierre Grolet, Orgerus, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 19, 1979, Ser. No. 86,607
Claims priority, application France, Oct. 19, 1978, 78 30026
Int. Cl.³ E21B 47/00
U.S. Cl. 175—321 **3 Claims**



1. A new device for measuring the stresses applied to the downhole assembly of a drill pipe, said device comprising measuring means operatively associated with at least one resilient member interconnecting two adjacent conduits which can respectively be coupled to an upper and to a lower part of said downhole assembly, a sleeve integral with one of said conduits and for protecting said resilient member against external radial pressure, wherein said conduits have substantially the same diameter at their adjacent ends, and wherein said sleeve and one of said conduits form the lateral walls of an annular space which houses at least one intermediate annular piston, said annular space limited by two annular elements forming the end walls thereof, said annular elements being integral with a first of said lateral walls, and slidable along the second of said walls, while said annular piston is integral with the second lateral wall and is slidable along said first wall, said piston separating two annular chambers, one of which communicates with the space outside the downhole assembly of the drill string, and the other communicating with the inner space of said downhole assembly, the operative annular cross-sections of said chambers on both sides of said piston being selected, in dependence on the values of the internal diameter of said annular space at the respective levels of the end walls thereof, so as to substantially nullify any axial load resulting from a pressure difference between the inner and the outer space of the downhole assembly of the drill pipe.

4,294,319

CUTTER HEAD FOR ROTARY PERCUSSION DRILLS

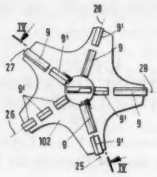
Karlheinz Guergen, Elsterkamp 3, 2110 Buchholz, Nordheide, Fed. Rep. of Germany

Filed Apr. 25, 1979, Ser. No. 33,305

Claims priority, application Fed. Rep. of Germany, May 16, 1978, 2821248; Sep. 25, 1978, 2841679

Int. Cl.[3] E21B *9/02*

U.S. Cl. 175—389 **5 Claims**



1. A rotary percussion drill bit comprising a drill stem having a pilot cutter at one end thereof, and a detachable main cutter head surrounding said drill stem shank and set back from the leading edge of said pilot cutter, said cutter head comprising a plurality of main cutter elements having their cutting edges arranged along outwardly extending main radial cutter lines, characterized in that said main cutter head is provided with both milling and hammering/chipping cutters along each of said main radial cutter lines, said cutter elements are spaced along said radial cutter lines with small gaps between adjacent cutters the gaps between the cutters of one radial cutter line are bridged by cutters arranged along another radial cutter line following said one radial cutter line in the direction of rotation of the cutter head.

4,294,320

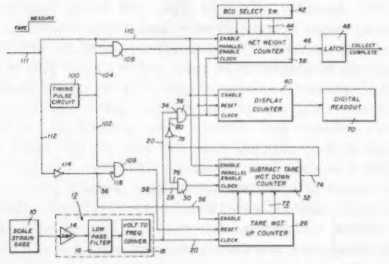
METHOD AND APPARATUS FOR WEIGHING MATERIAL BEING COLLECTED

Arnold C. Bilstad, Deerfield, and John T. Foley, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 6, 1980, Ser. No. 127,734

Int. Cl.[3] G01G *13/00, 23/14*

U.S. Cl. 177—1 **23 Claims**



1. A process for weighing material being collected, which comprises the steps of:

sensing the tare weight of the weight and collection apparatus;

sensing the weight of the material being collected;

providing pulses in frequency proportion to the weight sensed;

counting the tare weight pulses;

storing the tare weight count;

setting a net weight counter with a predetermined count corresponding to the maximum weight to be collected;

providing a measure weight signal to reverse the tare weight count;

inhibiting the net weight counter until the tare weight count reversal has been completed;

thereafter operating the net weight counter to count the sensed weight pulses; and

providing a completion signal when the predetermined count has been removed from the net weight counter.

4,294,321

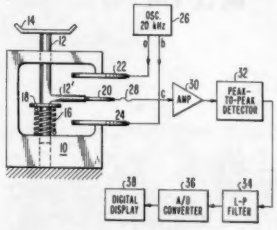
POSITION SENSING AND DISPLAY MEANS

Harold A. Wittlinger, Pennington, and Carmine P. Salerno, Avenel, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,118

Int. Cl.[3] G01G *3/14;* G01R *27/26;* H01G *7/00*

U.S. Cl. 177—210 FP **11 Claims**



1. The combination comprising:

two stationary spaced conductive members;

an electronic oscillator supplying an oscillation of one phase to one of said two members and an oscillation of the opposite phase to the other of the two members;

a movable conductive member having a position between said two stationary members dependent on the magnitude of a physical characteristic being measured; and

an amplitude detector means having an input directly connected to said movable conductive member and producing an output in accordance with the difference in the amplitudes of the oscillations of opposite phases coupled from the two stationary members to the one movable member.

4,294,322

ELECTRONIC WEIGHT MEASURING DEVICE

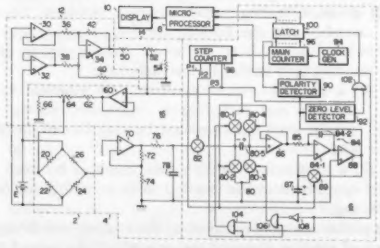
Yoshihisa Nishiyama, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed May 9, 1980, Ser. No. 148,499

Claims priority, application Japan, May 15, 1979, 59-489

Int. Cl.[3] G01G *3/14*

U.S. Cl. 177—210 R **11 Claims**



1. An electronic weight measuring device comprising:

a power source (E) having first and second power source terminals;

a reference power source terminal;

a load cell (**2**) coupled between said first and second power source terminals for producing between first and second output terminals an output voltage signal corresponding to a weight of load within a given weight measuring range;

a voltage generating circuit (**12**) coupled between said first and second power source terminals for generating an output voltage between the output terminal thereof and said reference power source terminal, the output voltage of said voltage generating circuit (**12**) being varied according to a voltage applied between said first and second power source terminals;

first bias means including a first potentiometer (**52**) having a movable terminal and two terminals respectively coupled to said reference power source terminal and to an output terminal of said voltage generating circuit;

second bias means including a second potentiometer (**64**) having two terminals respectively coupled to the movable terminal of said first potentiometer and said reference power source terminal, and a movable terminal coupled to the first output terminal of said load cell;

a signal processor circuit coupled to the second output terminal of said load cell and to the movable terminal of said first potentiometer and producing in response to an output signal from said first bias means an output signal corresponding to the output signal from said load cell within a range corresponding to said given weight measuring range and defined by positive and negative values;

analog-digital converter means coupled to said signal processor circuit to convert the output signal from said signal processor circuit into a digital signal; and

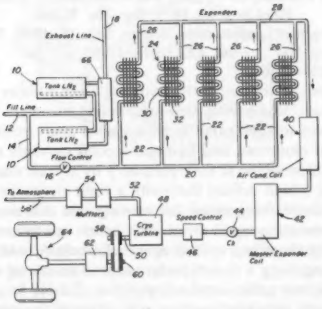
a digital processor unit coupled to said analog-digital converter means to produce an output signal representing a weight to be measured in response to an output signal from said analog-digital converter means.

4,294,323

CRYOGENIC POWERED VEHICLE

Harold L. Boese, Galveston, Tex., assignor to Cryogenics Unlimited, Galveston, Tex.

Filed Sep. 13, 1979, Ser. No. 75,235
Int. Cl.³ B60K *3/02*
U.S. Cl. 180—54 B **2 Claims**



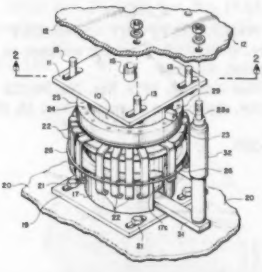
1. A cryogenic powered vehicle comprising insulated supply tank means for cryogenic liquid, a supply manifold communicated with the supply tank means, a one-way valve between the manifold and supply tank means, a plurality of heat absorbing expansion assemblies each having an inlet communicated directly with the supply manifold, a discharge manifold, each heat absorbing expansion assembly having an outlet communicating directly with the discharge manifold, a master expansion assembly communicating with the discharge manifold, a pressurized gas driven motor communicated with the master expansion assembly for imparting driving force to an output shaft, means communicating with the motor to discharge expanded gas to atmosphere and means directly and mechanically connecting the output shaft of the motor to the drive train of a vehicle, each of the heat absorbing expansion assemblies including a serpentine tube through which cryogenic fluid passes, heat exchange fins secured to the tube and baffle means in the tube to provide a spiral flow path to the fluid material to assure heat exchange contact between the material and the tube for absorbing heat from ambient air, said supply tank means including a pair of tanks for liquid nitrogen having a filler line extending to the lower portion thereof, an exhaust line communicated with each of the gaseous upper portions of the tanks, an exhaust expansion assembly connected with the exhaust lines from the tanks and an opened exhaust pipe connected to the exhaust expansion assembly for bleeding gaseous portions of the cryogenic fluid from upper portions of the tanks during refill thereby enabling the tanks to be completely refilled with liquid nitrogen.

4,294,324

CAB SUSPENSION AND RESTRAINING DEVICE

Charles A. Kimball, and Marc L. Sullivan, both of Salt Lake County, Utah, assignors to Time Commercial Financing Corporation, Salt Lake City, Utah

Filed Dec. 3, 1979, Ser. No. 99,467
Int. Cl.³ B62D *23/00*
U.S. Cl. 180—89.14 **10 Claims**



1. A cab suspension and restraining device for securing a tiltable automotive truck cab to the truck chassis, comprising a housing shell adapted to be secured to either the cab or the chassis; an air spring secured within said shell and having a bearing block extending beyond the shell; a second housing shell of larger diameter than the first and adapted to be secured to either the cab or the chassis in opposition to the first housing shell and to receive the said bearing block of the air spring as well as a portion of the first shell in the telescoped relationship; hydraulically operated restraining means for holding the two housing shells in their said telescoped relationship so as to substantially prevent relative lateral movement but to allow limited relative axial movement of the two during travel of the vehicle and to allow complete separation of the two when in unrestraining position; means for operating the restraining means; and means for operatively connecting the air spring to a source of pressurized air.

4,294,325

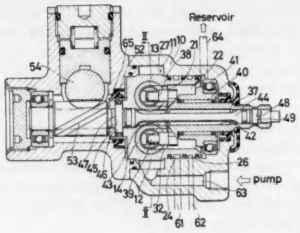
POWER ASSISTED STEERING SYSTEM FOR VEHICLES

Yoshihiko Nomura, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 6, 1979, Ser. No. 45,887
Claims priority, application Japan, Jun. 12, 1978, 53-80291[U]
Int. Cl.³ B62D *5/08*
U.S. Cl. 180—148 **2 Claims**

1. A power assisted steering system for vehicles comprising

a steering shaft adapted to be rotated by a steering wheel, rack means adapted to be connected to steering link means, pinion means engaged with said rack means, a torsion rod operatively connected to said pinion means and said steering shaft means at opposite ends thereof, said torsion rod and said pinion means being of integral one-piece construction with the diameter of said rod being substantially smaller than that of said pinion



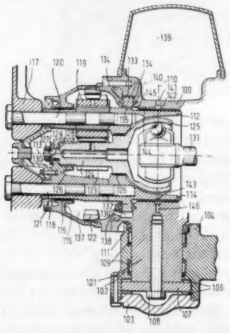
means, a valve body separate from said pinion means, means connecting said valve body to the end of said torsion rod operatively connected to said pinion means, hydraulic servomotor means operatively connected to said rack means and control valve means operatively connected to said steering shaft means and associated with said valve body for controlling the actuation of said hydraulic servomotor in accordance with the rotation of said steering shaft means.

4,294,326

WHEEL SUPPORT ASSEMBLY

Timothy S. Fry, Dunchurch, England, assignor to GKN Group Services Limited, England

Filed Nov. 14, 1979, Ser. No. 94,023
Claims priority, application Denmark, Nov. 15, 1978, 5073/78
Int. Cl.³ F16H *3/44*
U.S. Cl. 180—255 **5 Claims**



1. A motor vehicle support assembly, comprising a casing connected to a suspension component of the vehicle, a stub axle connected to a road wheel of the vehicle; at least one thin walled bearing liner within the casing receiving the stub axle with a bearing clearance; a thrust plate carried by the axle; thrust washer means carried by the casing and engaging the thrust plate for constraining relative axial movement between the axle and casing; a reservoir for lubricant above said bearing liners; means for delivering lubricant from said reservoir to said bearing liners; and means for returning lubricant to said reservoir upon rotation of said axle;

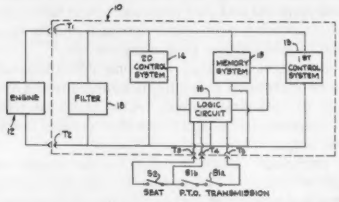
said means for returning lubricant to said reservoir comprising said thrust plate; means defining an annular groove in which said thrust plate is received, said groove having a radial clearance from said thrust plate over a lower part of the periphery thereof; means defining a sump in said casing and means for supplying lubricant from said sump to said clearance part of said groove; and means defining a passage from an upper part of said groove to said reservoir, whereby rotation of said thrust plate impels lubricant from said groove to said reservoir by way of said passage.

4,294,327

SAFETY INTERLOCK FOR MACHINE AND ENGINE WITH MAGNETO IGNITION

William A. Howard, Troy Township, Geauga County, Ohio, assignor to Delta Systems, Inc., Twinsburg, Ohio

Filed Dec. 15, 1978, Ser. No. 969,871
Int. Cl.³ B60K *23/00*
U.S. Cl. 180—273 **7 Claims**



1. In a vehicle driven through a transmission to a traction drive by an internal combustion engine that has a magneto ignition system and that has a seat occupied by a driver, a seat-operated switch that is closed when the seat is occupied and a transmission-operated switch that is open when the transmission is engaged, an electrical circuit connected between said swtiches and across a primary winding of the magneto ignition, said circuit including means for selectively shorting the primary winding when the engine is not running and the transmission-operated switch is open, and means for shorting the primary winding when the engine is running and both the seat-operated switch and the transmission-operated switch are open.

4,294,328

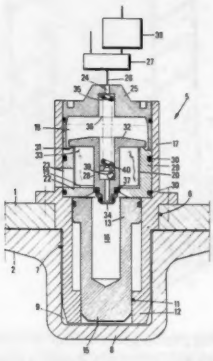
DEVICE FOR EMITTING ACOUSTIC WAVES IN A LIQUID MEDIUM BY IMPLOSION

Jacques Cholet, L'Etang la Ville; Pierre Magneville, Vernouillet, and Jean Cassand, Royan, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 18, 1979, Ser. No. 76,646
Claims priority, application France, Sep. 18, 1978, 78 26882
Int. Cl.³ G01V *1/38*
U.S. Cl. 181—120 **8 Claims**

1. A device for emitting acoustic waves in a water medium by implosion, comprising first and second members movable with respect to each other from a spaced apart position to a position of closeness, said first and second movable members being interconnected at their periphery by at least one flexible membrane which defines therewith a tight enclosure of variable volume, moving means for moving said first and second movable members apart from each other and intermittently maintaining them in a spaced apart relationship, said moving means comprising a first cylinder secured to one of said first and second movable members, a piston slidable in said first cylinder and provided with a rod adapted for coming in contact with a wall which is integral with the other of said first and second members, and a system for distributing pressurized fluid in order to exert on said piston an intermittent pushing force, said system comprising a second cylinder of fixed position with respect to said first cylinder and a source of pressurized fluid, said second cylinder including a first component, and a second compartment which is in communication intermittently with said first compartment through a first aperture, with said first cylinder through a second aperture, and perma-

nently in communication with an external medium through at least one third aperture, and said distribution system comprising a valve having a valve rod of smaller section than that of the valve head and movable from a first position wherein the valve head and the end of said valve rod respectively close substantially tightly said first and said second apertures of said second compartment and a second position where said first and



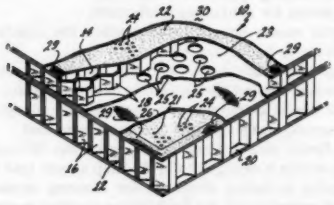
second apertures are opened, a channel being provided throughout said valve and in a direction parallel to its longitudinal axis, for feeding with pressurized fluid said first cylinder, intermittent feeding means for intermittently feeding with pressurized fluid the interior of said first compartment of said second cylinder and maintaining means for maintaining intermittently the pressurized fluid in said first cylinder.

4,294,329

DOUBLE LAYER ATTENUATION PANEL WITH TWO LAYERS OF LINEAR TYPE MATERIAL

Philip M. Rose, Chula Vista, and Frank J. Riel, San Diego, both of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Dec. 17, 1979, Ser. No. 103,913
Int. Cl.³ E04B *1/82*; F01N *1/24*
U.S. Cl. 181—222 **8 Claims**



1. A double layer acoustical honeycomb sandwich panel having structural strength for use in the severe environment in and around high velocity fluid flow paths associated with aircraft gas turbine engines comprising:

first and second honeycomb cores having a multiplicity of endwise directed cells with walls of thin sheet material disposed transversely to the panel;

an impervious facing of thin sheet material;

first, second and third facings of perforated thin sheet material; and

first and second thin sheets of porous fibrous material;

said impervious facing of this sheet material is adhesively bonded to one end wise cell face of said first honeycomb core;

said first perforated facing of thin sheet material is adhesively bonded to said first honeycomb core on the surface opposite said impervious facing of this sheet material;

said first thin sheet of porous fibrous material is adhesively bonded to the other surface of said first perforated facing of thin sheet material;

said third facing of perforated thin sheet material is adhesively bonded between one end wise cell surface of said second honeycomb core and to the other surface of said first thin sheet of porous fibrous material;

said second perforated facing of thin sheet material is adhesively bonded to the opposite surface of said second honeycomb core;

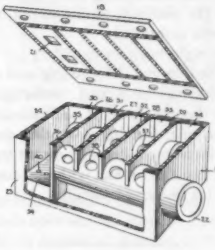
said second thin sheet of porous fibrous material is adhesively bonded to the opposite surface of said second perforated facing of this sheet material whereby a smooth outer surface is presented to a high velocity fluid flow.

4,294,330

MUFFLERS FOR PERCUSSIVE PNEUMATIC MACHINES

Stanley L. Baldwin, Winnipeg; Vernon Hampton, Thompson, and Tony F. W. Embleton, Ottawa, all of Canada, assignors to Inco Limited, Toronto, Canada

Filed Jan. 21, 1980, Ser. No. 113,742
Claims priority, application Canada, Feb. 13, 1979, 321357
Int. Cl.³ F01N *1/08, 1/02*
U.S. Cl. 181—230 **8 Claims**



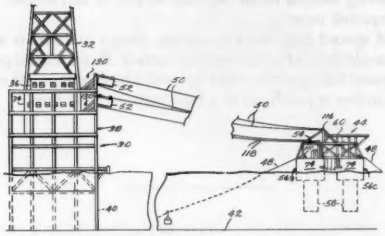
1. A muffler for a pneumatic impact device operating at a frequency below about 60 Hertz comprising a housing adapted to receive and discharge exhaust gas from said impact device and made of an elastic, high damping, hydrophobic material, a gas entrance chamber in said housing communicating with a Helmholtz resonator tuned to a frequency in the range of about 500 to 2,500 Hertz, a gas transport conduit exiting from said gas entrance chamber at an abrupt angle from the direction of gas entrance into said chamber, a plurality of first ports in the walls of said gas transport conduit, said first ports having a total cross-sectional area at least equal to the cross-sectional area of said gas transport conduit, a gas discharge conduit closed at its inner end and having a plurality of second ports in the walls thereof, a plurality of mutually isolated gas transport chambers each in communication with at least one of said first ports and at least one of said second ports, each of said gas transport chambers having a cross-sectional area substantially greater than the cross-sectional area of said first and second ports in communication therewith, the gas path in said transport chamber being at an abrupt angle from both the direction of flow in said gas transport conduit and in said gas discharge conduit.

4,294,331

METHOD AND SYSTEM FOR ESCAPING FROM AN OFFSHORE DRILLING PLATFORM

Ronald H. Reynoir; Robert A. Flautt, both of New Orleans, La., and Clyde M. Leavitt, Ocean Springs, Miss., assignors to The Reynoir Company, New Orleans, La.

Filed Dec. 12, 1979, Ser. No. 102,934
Int. Cl.³ A62B *1/02;* B63C *9/02*
U.S. Cl. 182—10 **17 Claims**



1. In a system for escaping from an offshore drilling or production platform, or the like, in emergency situations which includes an offshore platform in operative position substantially fixed relative to the marine bottom at an offshore location for engaging in hazardous operations involving combustible and explosive fluids entrapped in the marine bottom, a floating haven fixedly anchored near but at a safe distance from the platform, at least one cableway unsupported between its ends attached to and extending above water between the platform and the haven with the cableway inclining downwardly from the platform to the haven, and a personnel carrier suspended from and movable along the cableway for transferring personnel from the platform to the haven, the improvement wherein the haven comprises:

at least one upright buoyant cylinder;

means for ballasting and deballasting said cylinder;

means defining an enlarged watertight compartment mounted to the upper end of said cylinder with the top of said compartment forming a weather deck, said cylinder and said compartment-defining means together forming a structure ballastable to float with said compartment partly submerged for increased stability.

4,294,332

SCAFFOLD WITH GEAR DRIVE

Delbert L. Ready, P.O. Box 19462, Houston, Tex. 77024

Filed Apr. 13, 1979, Ser. No. 29,601
Int. Cl.³ E04G *1/20*
U.S. Cl. 182—141 **16 Claims**

1. A scaffolding unit comprising:

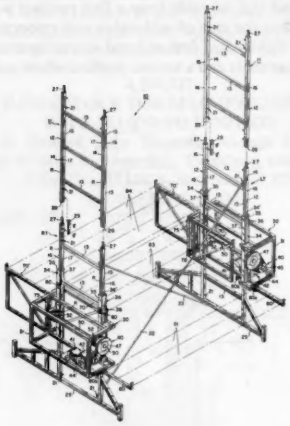
at least two towers each having a front and a back and each tower having a pair of rails, each rail having a linear gear rack facing the front of each tower;

bracing means for rigidly interconnecting said two rails;

cross-bracing members coupled to the rails of opposite towers for maintaining said towers in back-to-back and spaced relationship;

a platform-supporting carriage having a frame outwardly extending from the front of each tower, a pair of laterally-spaced upright shoes on said frame, each shoe having a U-shaped cross section adapted to movably embrace a rail, each shoe defining an opening facing the front of each tower, said shoes having open sides which face each other; and

bi-directional drive means on said frame for moving said carriage up and down on said towers, said drive



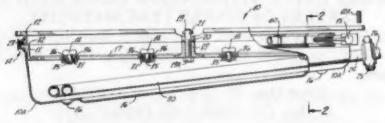
means having pinion gears meshable with the racks of said rails through said openings in said shoes.

4,294,333

OIL PAN ADAPTOR FOR INTERNAL COMBUSTION ENGINES

Barry S. Little, Mission Viejo, Calif.

Filed Jul. 20, 1978, Ser. No. 926,285
Int. Cl.³ F02F *7/00;* F16N *31/00*
U.S. Cl. 184—106 **9 Claims**



1. Lubricating apparatus comprising:

pan means for containing a lubricant;

adaptor means having a first surface for attachment to a device to be lubricated;

flange means fastened to said pan means and positioned to connect said adaptor means to said pan means;

quick release clamp means for securing said flange means to a second surface of said adaptor means; and

said flange means comprising a collar-like device having a lip which is engaged by said clamp means, said collar-like device including shoulders for securing means thereto, and embossments for establishing securing means relative to said adaptor means.

4,294,334

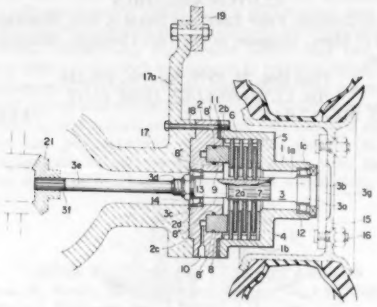
AXLE HOUSING SUB-ASSEMBLY

Akibumi Shinoda, and Masao Nakane, both of Handa, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jun. 5, 1979, Ser. No. 45,814
Claims priority, application Japan, Jun. 15, 1978, 53-83144[U]
Int. Cl.³ B60T *1/06;* F16D *55/36*
U.S. Cl. 188—18 A **7 Claims**

1. A disc brake system sub-assembly for use in a heavy load vehicle comprising; an axle shaft having a spline portion on one end thereof, a differential gear attached to said axle shaft at said spline portion, an axle housing having a through-hole, bearing

means fixed at one end of said through-hole, for rotatably supporting said axle shaft, a plurality of rotary disc plates engaging said axle shaft for rotation therewith, said rotary disc plates axially movable within said through-hole of said axle housing, a plurality of stationary disc plates disposed in said axle housing for axial movement within said through-hole, said stationary disc plates being arranged alternately with said



rotary disc plates, piston means adapted to close the other end of said through-hole, said piston means urging said stationary disc plates against said rotary disc plates when actuated and, means for joining said axle housing and said piston means as a unit, said sub-assembly further comprising further bearing means fixed in said piston means for rotatably supporting said axle shaft at the other end of said through-hole.

4,294,335

DEVICE FOR AUTOMATICALLY ADJUSTING A BRAKING CLEARANCE FOR A DISC BRAKE

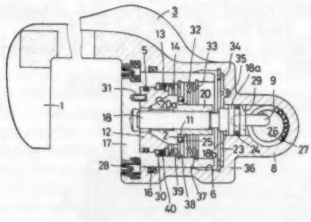
Toshifumi Maehara, Chichibu, Japan, assignor to Akebono Brake Industry Co., Ltd., Japan

Filed Oct. 5, 1979, Ser. No. 82,292

Claims priority, application Japan, Oct. 13, 1978, 53-139606[U]

Int. Cl.³ F16D *65/56*

U.S. Cl. 188—71.9 **6 Claims**



1. A device for automatically adjusting a braking clearance for a disc brake in which a friction pad is placed in frictional engagement with a disc rotor by a hydraulically-operated main piston, said device comprising:

an adjusting bolt slidable relative to an end wall of a cylinder in which said main piston is fitted, said adjusting bolt having one end which extends into a liquid chamber of the cylinder;

stop means for controlling movement of said adjusting bolt in a direction apart from the disc rotor;

an adjusting nut threaded on said adjusting bolt with a predetermined thread clearance;

first spring means retained between said main piston and said adjusting nut for transmitting to said adjusting nut the movement of said main piston in a direction toward the disc rotor;

a stepped piston slidably mounted within an inner periphery of said main piston, said stepped piston being subjected to a force in a direction away from the disc rotor by fluid pressure in said liquid chamber;

limit means for preventing rotation of said stepped piston in said main piston;

a frictional surface defined by each of said stepped piston and said adjusting nut and adapted for engagement with each other; and

second spring means disposed between said main piston and said stepped piston and adapted for biasing said stepped piston in a direction releasing engagement between said frictional surfaces, whereby in response to a given fluid pressure in said liquid chamber said stepped piston moves against said second spring means to engage said frictional surfaces and impede rotation of said adjusting nut.

4,294,336

DISC BRAKE

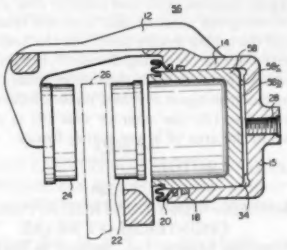
Kazuaki Shimizu, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 15, 1979, Ser. No. 20,624

Claims priority, application Japan, Mar. 30, 1978, 53-37122

Int. Cl.³ F16D *65/20*

U.S. Cl. 188—72.4 **7 Claims**



1. A disc brake comprising a cylinder means with opposed ends one of which is open and the other of which is closed, said cylinder means being formed at an inner surface of the closed end thereof with an annular groove which is located at the periphery of a circular bottom of said cylinder, cylindrical piston means slidably and sealingly disposed in said cylinder means to define in said cylinder means between said piston means and said closed end of said cylinder means an operating chamber into which an operating fluid is fed through a fluid inlet port formed in said closed end of said cylinder means, a first braking pad directly actuated by said piston means, a second braking pad actuated by said cylinder means through a calliper which is integral with said cylinder means, and a braking disc disposed between said first and second braking pads at the peripheral portion thereof, so that when a predetermined amount of operating fluid is introduced into said operating chamber to cause said piston means and said closed ends to be moved in opposite directions, said first and second braking pads are moved toward the opposed faces of said braking disc and finally brought into contact with the faces to grip said braking disc, wherein one of said cylinder means and said cylindrical piston means is integrally formed at its one end adjacent said closed end of said cylinder means with a groove which is arranged to communicate with both said annular groove and said fluid inlet port when said piston means is in contact with said closed end of said cylinder means.

4,294,337

BRAKING SYSTEM FOR A TRANSPORT CAR FOR TRANSPORTING FILES

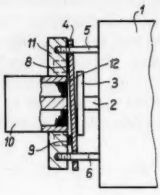
Edelbert Wiechert, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 13, 1979, Ser. No. 74,990

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842558

Int. Cl.³ B61H *5/00*

U.S. Cl. 188—171 **4 Claims**



1. A braking system for a transport car for transporting files or goods of similar weight running on profile rails with traveling rollers, equipped with a drive motor fed via wiper contacts of current paths designed on the profile rails, said braking system comprising a brake disc secured to the motor shaft for rotation therewith, and a counter disc aligned for engagement with the brake disc, a spring device for urging the counter disc toward the braking disc to establish a braking condition, an electromagnet coupled with said counter disc and energizable for withdrawing the counter disc from the brake disc against the force of the spring device to release the braking condition, characterized in that the spring device (**7**, **8**, **9**) is of unsymmetrical force configuration such that, upon initiation of energization of the electromagnet in a first phase of the withdrawal of the counter disc (**4**), the counter disc (**4**) is more strongly withdrawn in the area of lower spring forces.

4,294,338

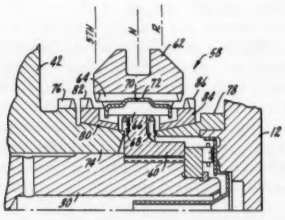
TRANSMISSION SHIFT CONTROL APPARATUS WITH COUNTERSHAFT BRAKE

John P. Simmons, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 9, 1979, Ser. No. 92,886

Int. Cl.³ B60K *41/28, 41/24;* **F16H** *3/38*

U.S. Cl. 192—4 A **16 Claims**



1. Apparatus comprising a ground member, a shaft rotatable relative to said member, a sleeve rotatable with and slidable relative to said shaft, said sleeve defining a spline, at least one thrust-transmitting strut in break-away connection with said sleeve for rotational and sliding movement therewith, and a blocker ring in rotational lost-motion connection with said strut adjacent said member, said blocker ring defining blocker teeth rotatable into and out of alignment with said spline, said sleeve being slidable for sliding said strut into thrust-transmitting engagement with said blocker ring such that said blocker ring establishes frictional braking contact with said member and said blocker teeth rotate out of alignment with said spline, said blocker teeth being rotatable into alignment with said spline upon braking of said shaft such that said sleeve is further slidable to release said break-away connection and thereby release said shaft for further rotation.

4,294,339

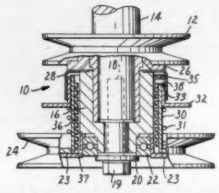
CLUTCH ASSEMBLY

Bruce A. Granger, Prior Lake, and David S. Klis, Minneapolis, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Dec. 21, 1979, Ser. No. 106,234

Int. Cl.³ F16D *67/02, 13/08, 13/12*

U.S. Cl. 192—12 BA **3 Claims**



1. An improved clutch assembly of the type having a driven hub, a rotatable member, clutch means for selectively driving the rotatable member from the driven hub, wherein the clutch means comprises a coiled spring secured to the rotatable member and surrounding the hub and having a first configuration in which the spring engages the hub to drive the rotatable member and a second configuration in which the spring disengages the hub to stop driving the rotatable member, and movable means secured by a first connecting means to the spring for placing the spring into its second configuration, wherein the improvement comprises:

safety means for connecting the spring to the movable means for continued operation of the clutch means in the event the first connecting means fails.

4,294,340

OVERLOAD CLUTCH

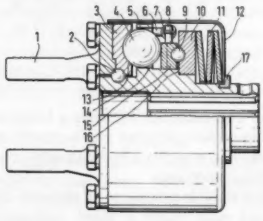
Dieter Kunze, Siegburg, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH, Siegburg, Fed. Rep. of Germany

Filed Nov. 21, 1979, Ser. No. 96,425

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1978, 2853293

Int. Cl.³ F16D *7/02, 43/20*

U.S. Cl. 192—56 R **11 Claims**



1. An overrunning clutch comprising: a driving member; a driven member; clutch engagement members; aperture means extending through one of said driving and driven members and having said engagement members operably supported therein; first recess means formed in the other of said driving and driven members; control ring means having second recess means formed therein and adapted to be angularly moved

between a first position where said engagement members are out of angular alignment with said second recess means, and a second position where said second recess means are brought into angular alignment with said engagement members; said engagement members being located between said control ring means and said other of said driving and driven members; axial spring means urging said control ring means against said engagement members, and urging said engagement members against said other of said driving and driven members; and circumferential spring means urging said control ring means toward said first position; said engagement members being held in torque transmitting engagement within said first recess means where said clutch is operated to transmit torque below a predetermined nominal value; said control ring means being moved against said circumferential spring means from said first position to said second position when said clutch is operated above said predetermined nominal value thereby to effect disengagement of said engagement members with said first recess means to bring said clutch into an overrunning condition.

4,294,341
GEAR RATIO SELECTION APPARATUS

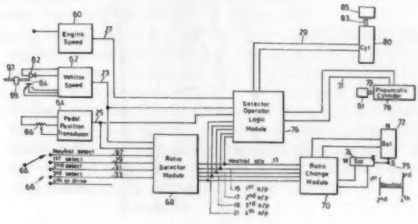
Petrus H. Swart, Bank Colliery, House No. 1A, Middelburg District, Transvaal, South Africa

Filed Feb. 9, 1979, Ser. No. 10,794

Claims priority, application South Africa, Feb. 15, 1978, 78/0885; Jun. 13, 1978, 78/3385

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.073 **14 Claims**



1. Gear ratio selector apparatus for use on a vehicle which has a manual shift gearbox with a gear changing mechanism and a manually operable clutch, the apparatus comprising: means for generating a first signal which is dependent on the vehicle speed, means for generating a second signal which is dependent on the vehicle's throttle position, means responsive to the first and second signals for generating gear ratio selection signals, means responsive to the gear ratio selection signals for disengaging the vehicle's clutch and acting directly on said gear changing mechanism to select a desired gear, means for deactivating the apparatus so that the manual shift gearbox can be operated manually, and means responsive to at least the first signal for controlling the engine speed during gear changes.

4,294,342
CENTRIFUGAL CLUTCH CONSTRUCTION

Richard C. St. John, North Canton, Ohio, assignor to Dyneer Corporation, Canton, Ohio

Continuation-in-part of Ser. No. 928,850, Jul. 28, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 118,502

Int. Cl.³ F16D *23/10*

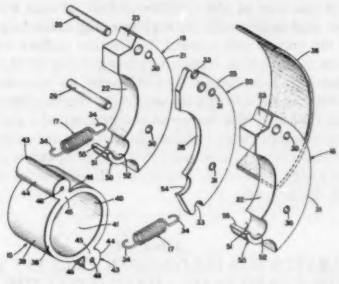
U.S. Cl. 192—105 CD **14 Claims**

1. An improved centrifugal clutch construction including:

(a) a driven clutch member;

(b) pivot collar means adapted to be mounted on a drive shaft for rotation with said drive shaft, the collar means having a cylindrical-shaped sleeve formed with a bore and a pair of diametrically opposed cylindrical-shaped projection means mounted externally on the sleeve and extending along the parallel with the axis of said sleeve, with the imaginary outer circumferences of the projection means lying in abutting or overlapping relationship with respect to the imaginary outer circumference of the sleeve at the mounting location therebetween when viewed in transverse cross section;

(c) a pair of clutch shoe means, each shoe means being pivotally mounted on a respective one of the pair of projection means for pivotal movement outwardly toward



and against the driven clutch member under the influence of centrifugal force from retracted to extended positions; and

(d) discontinuous opening means formed in an end of each of the clutch shoe means for receiving the projection means therein to pivotally mount the shoe means on said projection means, said opening means having a partial circular cross-sectional configuration of greater than 180° and less than 360° complementary to the cross-sectional configuration of the projection means.

4,294,343
FRICTION CLUTCH FOR MOTOR VEHICLES

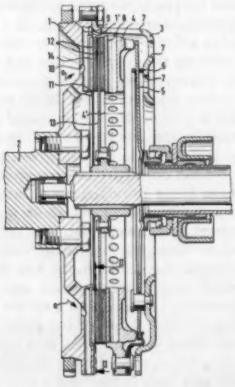
Walter Reh, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 26, 1979, Ser. No. 15,152

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2808019

Int. Cl.³ F16D *13/72*

U.S. Cl. 192—113 A **6 Claims**



1. A friction clutch for a motor vehicle, comprising a flywheel disk means having an end face acting predominantly as a friction surface, said end face being provided with a steel

insert, a clutch cover means rigidly connected with the flywheel disk means, said clutch cover means having a plurality of openings and surrounding a pressure ring means and at least one spring, said spring being supported, on the one hand, at the clutch cover means and, on the other, forcing the pressure ring means against the steel insert of the friction surface of said flywheel disk means in the engaged condition of the clutch by way of a friction disk, said flywheel disk means being provided with a plurality of substantially uniformly distributed and outwardly extending aperture means each having a through-opening on the side of the engine and a through-opening on the side of the friction surface of said flywheel disk means, said engine side through-opening extending outwardly from the engine side toward the friction surface side and said friction surface side through-opening being in the form of a substantially longitudinal slot whereby air may be drawn in from the engine side and conducted to the friction surface side of said flywheel disk means in the manner of a radial blower, said substantially longitudinal slot partially accepting said steel insert and being so designed that the steel insert can be subjected to the flow of cooling air on all sides at least when said clutch disengaged.

4,294,344

APPARATUS FOR POSITIONING ARTICLES BETWEEN THE CARRIERS OF A DRAG CONVEYOR, SAID ARTICLES BEING FED IN A CONTINUOUS CLOSED ROW

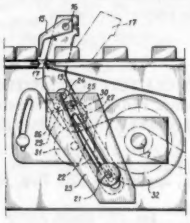
Johannes D. van Maanen, Berkel en Rodenrijs, Netherlands, assignor to Tevopharm-Schiedam B.V., Netherlands

Filed Sep. 20, 1979, Ser. No. 77,375

Claims priority, application Netherlands, Sep. 21, 1978, 7809612

Int. Cl.³ B65G *47/31*

U.S. Cl. 198—461 **3 Claims**



1. Apparatus for positioning articles between the carriers of a drag conveyor, said articles being fed in a continuous closed row, comprising a first conveyor belt or conveyor-belt system, capable of receiving the articles at one end and a second conveyor belt or conveyor-belt system disposed in line with the first conveyor belt, said second belt being arranged to move at a speed which is greater than the speed of the first conveyor belt and to transfer the articles to the drag conveyor, characterized in that at the transition point between the first conveyor belt and the second conveyor belt a stop means is provided, said stop means being provided on an arm, said arm being mounted for a pivotal movement about a pivot point and a sliding movement along said point, said arm being connected to a crank means through a link means, said link means at one end being pivotably connected to the arm and at its other end being connected to said crank means and intermediate said ends being pivotably connected to a rocker element mounted for a pivotal movement about a fixed point, the movement of said stop means being synchronized with respect to the movement of the drag conveyor, said stop means being movable in a endless path, said path comprising a first portion extending essentially parallel to the first conveyor belt in the direction of travel, a second portion directed backwards and away from the conveyor belt and a third portion directed again towards the conveyor belt, such that during operation, in the first path portion the stop means moves along with and at a distance in front of an article which is advanced by said first conveyor belt, then in the second path portion said stop means moves away from said article and past said article to the rear and subsequently, in the third path portion, said stop means returns to its starting point behind the article then being moved along faster by the second conveyor belt and in front of the next article still lying on the first conveyor belt.

4,294,345

UNIVERSAL JOINT-LINK CHAIN

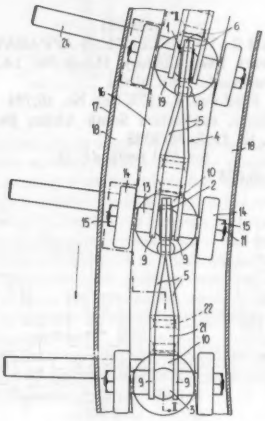
Hans-Ulrich Stauber, Grüt, and Jürg Eberle, Hinwil, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Continuation of Ser. No. 703,834, Jul. 9, 1976, abandoned. This application Jan. 5, 1978, Ser. No. 867,027

Claims priority, application Switzerland, Jul. 28, 1975, 9810/75

Int. Cl.³ B65G *17/32*

U.S. Cl. 198—683 **4 Claims**



1. A universal joint-link chain comprising a plurality of chain links, each chain link having opposed ends, one end of each chain link being provided with a hinge body and the opposite end with a hinge socket, the hinge socket of one chain link receiving the hinge body of the neighboring chain lnk, each hinge socket and each hinge body being formed as an equatorial spherical segment, each chain link including a connection element engaging with the hinge bodies, said hinge body being wider than the hinge sockets, a shaft for mounting each hinge body, said shaft having opposed ends, travelling wheels provided at the opposed ends of the shaft, a substantially C-shaped guide channel which is downwardly open, said guide channel having spaced apart confronting flanges and a rear channel wall oppositely spaced from said flanges, a guide wheel arranged at the region of the travelling wheels, said guide wheel having an axis extending essentially perpendicular to its related connection element and through the center of the associated spherical segment, said confronting flanges serving as tracks for the travelling wheels and for guiding therebetween the guide wheels, said rear channel wall serving as a track for one of the travelling wheels when the chain carries a load, support means carried by each chain link, said support means including means for the attachment of a conveyed material, said attachment means of the support means comprising a lateral offloading attachment element, said offloading attachment element extending substantially parallel to and in vertically spaced relationship from the axis of the shaft and further extending laterally from the underside of the guide channel and transversely to the direction of movement of the chain, said lateral

offloading attachment element, when loaded by said conveyed material, exerting a moment upon the travelling wheels such that one travelling wheel at an end of the shaft bears against its related flange while the other travelling wheel at the other end of the shaft bears against the rear channel wall to provide a stable position for the universal joint-link chain.

4,294,346

BALER FEEDER MECHANISM

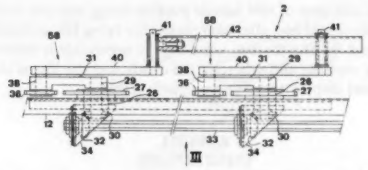
Frans J. G. C. Decoene, Zedelgem; Etienne R. O. C. Hommez, Oostende, and Adrianus Naaktgeboren, Zedelgem, all of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Sep. 19, 1979, Ser. No. 77,253

Claims priority, application United Kingdom, Sep. 30, 1978, 38836/78

Int. Cl.³ B65G *25/02*

U.S. Cl. 198—740 **8 Claims**



1. A baler having a drive shaft and a plurality of housing walls adjacent a feed mechanism comprising:

a feed bar carrying a plurality of tines; and

means for driving the feed bar in an elliptical path, said means including a first shaft having a first crank connected at one end thereof, said first crank rotatably supporting first and second gears, said first gear being a reversing gear intermeshing with a stationary gear and said second gear, said stationary gear supported by one of said walls, a second shaft supporting said second gear at one end thereof and a second crank at another end thereof, said second crank connected to said feed bar.

4,294,347

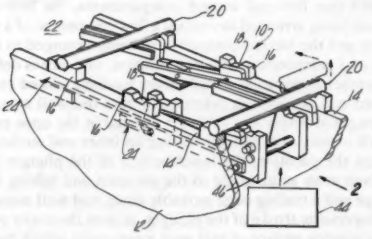
AUTOMATIC ACCUMULATING LIFT AND CARRY TRANSFER MECHANISM

James L. Furlette, and Donald A. Stadler, both of 1101 Copper Ave., Fenton, Mich. 48430

Filed Feb. 21, 1979, Ser. No. 13,458

Int. Cl.³ B65G *23/02, 43/08*

U.S. Cl. 198—751 **13 Claims**



1. A mechanical automatic accumulating transfer mechanism comprising:

an elongated frame, said frame comprising a plurality of work support members secured to and spaced longitudinally along said frame and on each lateral side thereof, said support members on opposite lateral sides of the frame being in alignment with each other and forming a work station along the frame adapted to receive and support a workpiece;

a carriage assembly and means for longitudinally slidably mounting said carriage assembly to said frame between a forward and a retracted position and means for vertically slidably mounting said carriage assembly to said frame between an upper and a lower position;

means for moving said carriage assembly between said upper and said lower position;

means for longitudinally reciprocally moving said carriage assembly in a forward direction with said carriage assembly in said upper position, and for moving said carriage in the reverse direction with said carriage assembly in its lower position;

a plurality of lifting members pivotally secured to said carriage assembly at longitudinally spaced intervals therealong so that at least one lifting member is associated with each work station, said lifting members being pivotal between an upper workpiece engaging position and a lower workpiece clearing position whereby with said lifting members in their work engaging position, said lifting members lift and carry a workpiece from the support members at their associated work station and to the next forward work station;

knockdown means for pivoting said lifting members to their workpiece clearing position prior to the rearward longitudinal travel of said carriage assembly;

means for detecting the absence of a workpiece at a work station;

means responsive to said detecting means for actuating the lifting member associated with the vacant work station from the workpiece clearing position and to the workpiece engaging position during rearward longitudinal travel of the carriage assembly;

means for pivoting all lifting members rearwardly of a lifting member actuated by said actuating means from their workpiece clearing position and to their workpiece engaging position; and

said carriage assembly further comprising an upper part and a lower part, said upper part being vertically slidably mounted to said frame, means for longitudinally slidably mounting said upper part to said lower part and said lifting members being pivotally mounted to said upper part.

4,294,348

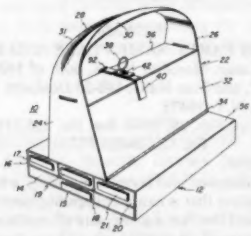
CARRYING CASE FOR ARTIST'S MATERIALS

Jeanne D. Hastings, Old Stone School House, Middle Rd., Lake George, N.Y. 12845

Filed Mar. 24, 1980, Ser. No. 133,529

Int. Cl.³ B65D *71/00*; A45C *13/18*

U.S. Cl. 206—1.7 **10 Claims**



1. A paint box for storing and transporting artist's materials, said paint box comprising

a base storage section having an upper flat surface and having a plurality of drawers slidably arranged to open at one end,

a main body storage section mounted on said base and comprising a front end located on the same side as said one

end, a back end opposite said front end, a top connected between said front end and said back end, a first dropping side attached by a hinging means to said base on one side of said body and spaced inwardly from one side of said base to permit said first side to rest flat upon said base or to stand substantially upright enclosing a first opening bounded by said front end, said top and said back end, and a second dropping side attached by a hinging means to said base on the side opposite to said one side and spaced inwardly from the side opposite said one side of said base to permit said second side to rest flat upon said base or to stand substantially upright enclosing a second opening, opposite said first opening, bounded by said front end, said top and said back end.

4,294,349

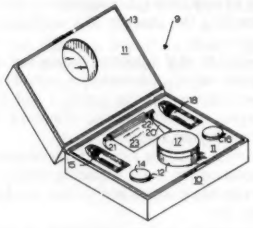
KIT FOR REPAIR OF PORCELAIN DENTAL PROSTHESES

Robert L. Ibsen, and William R. Glace, both of Santa Maria, Calif., assignors to Den-Mat, Inc., Santa Maria, Calif.

Division of Ser. No. 926,943, Jul. 21, 1978, Pat. No. 4,256,603, which is a division of Ser. No. 787,754, Apr. 15, 1977, Pat. No. 4,117,595. This application Jun. 11, 1980, Ser. No. 158,487

Int. Cl.³ B65D *81/32*

U.S. Cl. 206—63.5 **13 Claims**



1. A kit for the repair of damaged or fractured porcelain dental prosthesis comprising

a box,

a priming agent,

a bonding agent to adhere a restorative agent to porcelain and metal,

a pigmented masking restorative agent for said metal base,

a white powder restorative agent,

a resin for mixture with each said restorative agent to bond said masking agent and said white powder in turn, to said bonding agent,

each of said agents and said resin being disposed in separate containers within said box.

4,294,350

SHOWER PARTY NAME PLATE AND FAVOR

Margaret J. Haase; Meredith Hasse, both of 140-25 Donizetti Pl., Apt. 25E, and Joan Halle, 140-25 Donizetti Pl., Apt. 25F, all of Bronx, N.Y. 10475

Filed Feb. 28, 1980, Ser. No. 125,327

Int. Cl.³ B65D *77/00*

U.S. Cl. 206—216 **1 Claim**

1. A party nameplate and favor comprising, a bag made of a flexible mesh fabric that is easily collapsible, said bag designed to hold candy and the like; a nameplate of cardboard affixed to said bag, said nameplate comprising a shape having a handle portion and a decorative portion affixed to said handle portion, said handle portion having a spur for engagement with said mesh bag; said handle portion and said decorative portion being arranged in an overlap formation such that the overlapping portions of each are attached to each other and a portion of the overlapped portion of said handle portion having said spur thereon, that portion of said handle portion comprising said spur being free from permanent bonding with said decorative portion; means for tying said handle portion to said bag at that portion of said handle portion remote from the overlapping portion thereof, said means for tying also serving to close off said bag after the candy and the like have been inserted

therein; said spur of said handle portion being inserted through the mesh of said bag after said means for tying has secured the candy and the like therein, whereby the nameplate is held erect for easy viewing and whereby the candy and the like is stored in a visual display to serve as a party favor.

4,294,351

CONTAINERS

Jeffery J. Cheetham, 5 Brunsdon St., Bayswater, Victoria, Australia (3153)

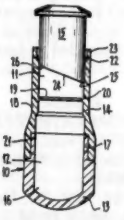
Continuation of Ser. No. 774,950, Mar. 7, 1977, Pat. No. 4,167,228. This application Jul. 17, 1979, Ser. No. 58,260

Claims priority, application Australia, May 5, 1976, PC5817; Oct. 18, 1976, PC7760

The portion of the term of this patent subsequent to Sep. 11, 1996, has been disclaimed.

Int. Cl.³ B65D *25/08*

U.S. Cl. 206—222 **7 Claims**



1. A container comprising means defining a chamber separated into first and second compartments, the first compartment being arranged to contain a first component of a composition and the second compartment being arranged to contain a second component of the composition, said means defining the chamber comprising a wall means having a closed end and an open end, a partition extending across the wall means, and a plunger slidingly and sealingly located in the open end of the wall means, said plunger having an inner end surface spaced from the partition, the inner surface of the plunger being inclined at an acute angle to the partition and having a leading edge and a trailing edge movable along said wall means during a depression stroke of the plunger, at least the major portion of the interior surface of said wall means over which the leading and trailing edges of said inner surface of said plunger move during its depression stroke defining a chamber portion of substantially uniform lateral dimensions on both sides of said partition, said first compartment being defined by part of the wall means, said partition and the inner surface of said plunger, and the second compartment being defined by the closed end of the wall means and the partition, whereby upon the plunger being depressed the leading edge of the inner surface first

separates a corresponding portion of the margin of the partition from the wall means, and then the partition is hinged toward the second compartment by progressive contact with the inner surface and corresponding progressive separation of the margin of the partition from the wall means, the stroke of the plunger being limited so as to leave an unseparated portion of the margin of the partition.

4,294,352

CATASTROPHIC-EXPOSURE EMERGENCY KIT

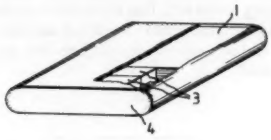
Rudolf Fitzke, Mariannenplatz 2, 1000 Berlin 36, Fed. Rep. of Germany

Filed May 28, 1980, Ser. No. 154,090

Claims priority, application Fed. Rep. of Germany, May 31, 1979, 2922507

Int. Cl.³ B65D *85/18, 85/56, 81/00*

U.S. Cl. 206—223 **2 Claims**



1. A conveniently transportable emergency kit for use in adverse environmental conditions, comprising:

a pouch dimensioned to receive the head of a user and composed of a synthetic resin foil having a gold metallic outer surface and a silver metallic inner surface;

folded rectangular sheet of synthetic resin foil received in said pouch and dimensioned to wrap around the body of a user, said foil being composed of synthetic resin and having a silver metallized surface adapted to reflect body heat back to the user and a gold metallized surface adapted to be readily detected by the rescuer; and

a supply of vitamins capable of sustaining life in the absence of other sustenance for an extended period received in said pouch.

4,294,353

SIDE CONNECTED CIGARETTE HALF-PACKS

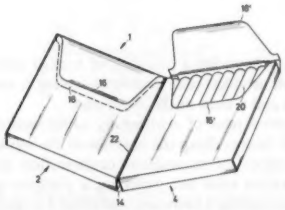
Heinz H. Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Jan. 16, 1980, Ser. No. 112,491

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1979, 7901873[U]

Int. Cl.³ B65D *85/10*

U.S. Cl. 206—273 **8 Claims**



1. A pack for enclosing a pair of cigarette groups, comprising two partial packs connected together via a fold line and made from a one-piece blank, each said partial pack being provided with a rear wall having a closing flap attached thereto by means of an intermediate cover wall, and a front wall having a cut-out portion adapted for the insertion of said closing flap therebehind, wherein said rear wall and said frontal wall of each partial package are connected to one another by a bottom wall, said frontal walls facing one another when said pack is folded so as to be closed, and wherein said fold line defines a center line of a center bridge extending between said partial packs, said center bridge, when folded along said fold line, extending between the planes of said rear walls and said frontal walls.

4,294,354

PACKAGING CASE

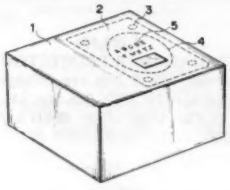
Shoji Ariga, Toda, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1979, Ser. No. 102,078

Claims priority, application Japan, Dec. 15, 1978, 53-172497[U]

Int. Cl.³ B65D *85/00;* **H01R** *43/00*

U.S. Cl. 206—335 **3 Claims**



1. A packaging case, comprising: a plurality of walls defining a container for containing an article which is adapted to be flush-mounted on a mounting structure by fastening means, said article having a centrally located, projecting, back portion; at least one of said walls having depicted thereon the outlines of (1) an outer, first pattern having the shape of the perimeter of the zone within which the article is to be flush-mounted on the mounting structure, (2) a second pattern of holes disposed inside said first pattern and substantially corresponding to the locations of the fastening means for fastening the article on the mounting structure and (3) a third pattern of an opening centrally disposed inside said first pattern, spaced from said second pattern and substantially corresponding to the shape of the perimeter of the hole to be cut in the mounting structure for receiving the projecting back portion of the article, said third pattern having marked thereon instructions for mounting the article on the mounting structure, said first pattern being detachable from the remainder of said container so as to be useable as a template for marking the location at which the article is to be mounted on the mounting structure, said second and third patterns being detachable from said first pattern so as to be useable for marking the locations of said holes and said opening, respectively, on the mounting structure.

4,294,355

CARTRIDGE FOR HEMOSTATIC CLIPS

Stephen J. Jewusiak, Denville; Howard Beroff, Bridgewater, and Michael Schuler, Edison, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

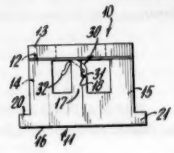
Filed Dec. 6, 1979, Ser. No. 100,778

Int. Cl.³ B65D *85/24*

U.S. Cl. 206—339 **22 Claims**

1. A cartridge for holding a plurality of plastic ligating clips, each clip having one leg terminating in a hook-like head member adapted to engage and retain the free end of the other leg of the clip when the clip is closed by pivoting about an integral hinge section, comprising a body member having a base and two side walls forming an elongated channel

a central rail extending from the base of said channel along the length thereof parallel to and spaced from said side walls said rail having a step on one side thereof forming a ledge extending along the length of said rail



a plurality of uniformly spaced notches along the top of said rail angled toward said ledge

and means for holding one leg of a clip in position on said rail with the head of the clip on said ledge and the leg of said clip resting on the angled surface of said notch.

4,294,356

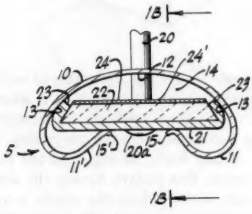
DENTAL MIRROR PROTECTOR CASE

Herbert Abramowitz, 143-19 25th Ave., Whitestone, N.Y. 11357

Filed Apr. 21, 1980, Ser. No. 141,994

Int. Cl.³ A45C *11/00*; B65D *85/38*

U.S. Cl. 206—368 **12 Claims**



1. A mirror protector case comprising in combination: a mirror cover means for protecting a mirror reflective surface against contact with exterior objects and against contact with an interior surface of the mirror cover means, said mirror cover means including a cover structure having an interior-space surface of concave shape formed as a centrally positioned recess positioned between spaced-apart mirror-contact surfaces, and said mirror cover means further including spring structure mounted on said cover structure and positioned to exert biasing pressure against a rearward wall of a mirror such that mirror bezel structure on each of opposite sides of and adjacent to reflective mirror structure, is pressed against said spaced-apart mirror-contact surfaces, said recess being sufficiently concave that exposed mirror reflective surface is devoid of contact with and is spaced from said interior surface when mirror bezel structure is pressed against the spaced-apart mirror-contact surfaces.

4,294,357

POP UP ABRASIVE DISC DISPENSER

John H. Stevens, Germantown, Tenn., and Bruce A. Reidel, East Amherst, N.Y., assignors to Kennecott Corporation, Stamford, Conn.

Filed Jan. 10, 1980, Ser. No. 110,878

Int. Cl.³ B65D *85/67, 85/672*

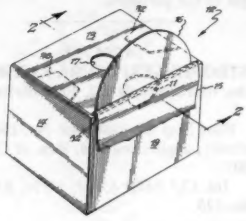
U.S. Cl. 206—409 **21 Claims**

1. A device for shipping, storage, protection and dispensing of abrasive discs comprising,

a rectangular box having a bottom, a front wall, a back wall, two side walls and a top closure member connected with each other to define a container, said top closure means hingedly connected to the back wall of said container,

a flap hingedly connected to the portion of said top closure adjacent said front wall and extending into said container adjacent to the front wall of said container,

a roll, comprising abrasive discs, said discs having an abrasive surface and an adhesive surface releasably adhered on



said adhesive surface to a continuous flexible backing, said roll being rolled such that the abrasive surface of said discs faces toward the center of said roll, arranged such that the outer end of said roll extends between said flap and said front wall.

4,294,358

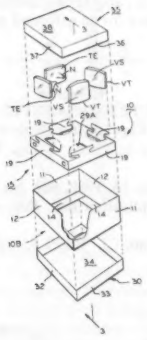
PACKAGE FOR VIDEO TUBES

James F. Nauheimer, Chicago, and Steven J. Benzschawel, Carol Stream, both of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed Apr. 14, 1980, Ser. No. 140,301

Int. Cl.³ B65D *85/42*

U.S. Cl. 206—419 **3 Claims**



1. In a package for a plurality of necked articles of commerce, such as video tube envelopes having a viewing screen at one end and a neck at the other end:

(a) a walled tube of rectangular cross-section having inturned flanges along the bottoms of the walls of said tube;

(b) a platform of rectangular cross-section nesting within said walled tube and including a platform panel having flaps extending downward against said flanges to maintain said platform in spaced relationship to said flanges;

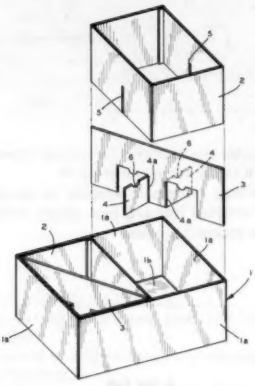
(c) protective and support means formed in said platform panel for said tube envelopes comprising at least one cutout panel in said platform panel, one portion of which is foldable with respect to said platform panel and downward against an inturned flange to brace against said inturned flange and form a support for a tube envelope.

4,294,359

RESHIPPER CARTON FOR FINISHED OR UNFINISHED TV BULBS

Michael R. Berkel, Circleville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 28, 1980, Ser. No. 116,332
Int. Cl.[3] B65D *85/42*
U.S. Cl. 206—422 15 Claims



1. A carton for a pair of TV bulbs or funnels having a large rectangular end tapering down to an integral neck tubulation, comprising:

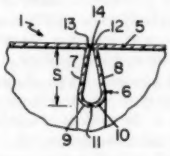
1. a corrugated box having a bottom and four vertical side walls disposed in rectangular relationship;
2. a vertical corrugated partition extending diagonally between two corners of said side walls, thereby dividing the box space into two equal compartments of triangular configuration;
3. a pair of integral flaps respectively formed in said partition and swung horizontally outwardly from opposite sides of said partition to respectively traverse said compartments and contact opposed side walls of said box; and
4. means on each said flap for engaging the neck tubulation portion of a TV bulb or funnel inserted in the respective compartment to secure same for shipment.

4,294,360

STERILE ARTICLE CONTAINER WITH STERILE OPENING EDGE PORTIONS

Harry H. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407

Filed Aug. 13, 1979, Ser. No. 65,924
Int. Cl.[3] B65D *75/58, 77/38*
U.S. Cl. 206—438 9 Claims



1. A container for a sterile article, said container comprising a tube of material inpenetratable to contaminants, a pair of adjacent portions of said tube extending into the interior of said tube, a seal joining the outermost ends of said portions about the periphery of each thereof, said seal being inpenetrable to contaminants forming a contamination barrier whereby both surfaces of each said portion lie within said tube inside such barrier, and said seal being separable upon manual forces applied to said container at the ends thereof in a direction which moves said ends apart, the innermost ends of said portions being separable without tearing said tube at other than said innermost ends by continued application of said forces whereby said container is opened providing edges about the openings formed by said innermost ends of said portions with the surfaces of said portions on both sides of said edges being those surfaces retained inside of said contamination barrier prior to opening said container.

4,294,361

PUSH AND PEEL BLISTER STRIP PACKAGES

Herman Margulies, South Orange, and Richard H. Kaufman, Ridgewood, both of N.J., assignors to Sterling Drug, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 28,399, Apr. 9, 1979, abandoned. This application Dec. 26, 1979, Ser. No. 106,850
Int. Cl.[3] B65D *83/04, 85/56, 75/36, 75/58*
U.S. Cl. 206—532 17 Claims

1. A blister strip package comprising a pair of heat sealable co-extensive sheets one of which is provided with a first cavity or row of spaced first cavities for containing a product to be dispensed, and a second cavity or row of second cavities each of which is laterally aligned with a corresponding first cavity and spaced therefrom, said sheets being heat sealed to one another except in the areas defined by the first and second cavities;

the other of said sheets overlying both said first and second cavities and covering the same;

said second cavities being adapted to being pushed inwards to an inverted state in order to disrupt the sheet covering said second cavities thereby providing a pull tab formed by the sheet covering said second cavities and enabling said sheet to be peeled back towards a respective first cavity to provide access thereto;

said second cavities having edges defining the area for peeling back the sheet covering the cavities.

4,294,362

PARALLELEPIPEDIC PACKING CONTAINER

Kjell H. Martensson, Malmö, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Apr. 29, 1980, Ser. No. 144,862
Claims priority, application Sweden, May 10, 1979, 7904103
Int. Cl.[3] B43M *7/00;* B65D *5/70, 5/54*
U.S. Cl. 206—622 12 Claims

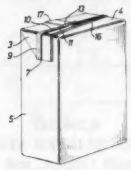
1. A packing container of the type having an end wall and adjacent side walls and being substantially in the shape of a parallelepiped, said container comprising:

a sealing fin integral with said end wall, said sealing fin having a free edge, and when said container is sealed said fin overlies said end wall and a portion of an adjacent side wall;

said sealing fin including a triangular lug extending from said end wall and overlying said side wall;

a tear line in said sealing fin extending from a point adjacent said triangular lug along a portion of said sealing fin;

said free edge of said sealing fin being oblique with respect to said end wall and having a greater width adjacent said



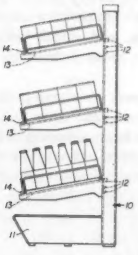
triangular lug than adjacent the opposite end of said sealing fin.

4,294,363

MERCHANDISE SHELVING DISPLAY

Muammer A. Oztekin, and Vincent J. Albano, both of Birmingham, Ala., assignors to The Kent Corporation, Birmingham, Ala.

Filed Dec. 17, 1979, Ser. No. 104,192
Int. Cl.³ A47F *1/00*
U.S. Cl. 211—49 D **3 Claims**



1. In a merchandise shelving display having at least one downwardly inclined shelf panel supported from a supporting frame,

(a) at least one downwardly inclined track unit integrally formed and having a pair of upstanding outer rails extending in spaced parallel relation to each other and a pair of upstanding inner rails between said outer rails and extending in spaced parallel relation to each other and said outer rails with the upper surfaces of said outer rails being at an elevation below the elevation of the upper surfaces of said inner rails, and

(b) means securing said track unit to the upper surface of said shelf panel.

4,294,364

LOG CRADLE

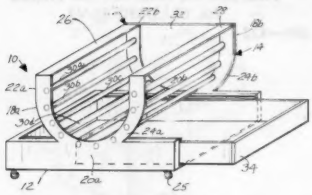
Donald L. Bilbrey, 3481 Mills Acres, Flint, Mich. 48503

Filed Feb. 16, 1979, Ser. No. 12,642
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—60 R **6 Claims**

1. A storage device for storing kindling materials comprising:

a base;

means for receiving kindling materials mounted on the base and having a bottom and sides provided with air access means, the means for receiving kindling material defined by a frame, the frame comprising at least two opposed frame members mounted to the base and a plurality of



material supporting elements extending between and supported from the frame members; and

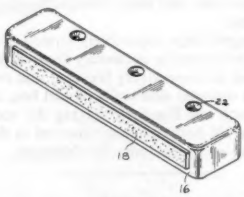
a debris receiving receptacle adapted to be slidingly and removably inserted into and nest snugly within the base, beneath the receiving means.

4,294,365

COMBINED DART RACK AND SAFETY DEPOSITORY

Ellsworth S. Henderson, 9532 Lamar St., Spring Valley, Calif. 92077

Filed Nov. 6, 1979, Ser. No. 91,705
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—60 R **1 Claim**



1. A combined rack and safety depository for game darts having a spike tip and weighted boss at the base of the spike tip, said rack and safety depository comprising:

(a) an elongated, one-piece, generally rectangular simple parallelepiped hollow box-like body having a horizontal flat closed top, an open bottom and substantially vertical side walls when the rack is oriented as in use;

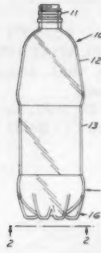
(b) adhesive, no-mar attachment means on one of said side walls enabling said body to be readily removably mounted on a wall surface with said top extending horizontally along and normal to said wall surface;

(c) said body having separate free standing cylindrical sockets extending normal to said top from said top substantially to the plane of the bottom of said body for substantially completely sheathing and protecting the spikes of said darts and said sockets having countersunk annular portions at said top functioning as guides to direct dart spikes into said sockets and also to serve as seats to receive terminals of said bosses, said sockets being offset horizontally from a longitudinal vertical center plane of said body toward the other of said vetical side walls to space darts well away from said wall surface so that the flights of said darts are not damaged by wall contact and finger access to said darts is assured, the lower ends of said sockets being open.

4,294,366
FREE-STANDING PLASTIC BOTTLE

Long F. Chang, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 17, 1980, Ser. No. 130,777
Int. Cl.³ B65D *23/00, 1/02*
U.S. Cl. 215—1 C **4 Claims**



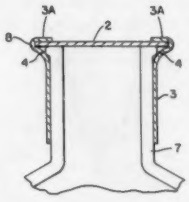
1. A plastic container comprising
a side wall having an oriented generally cylindrical lower portion, and
a bottom joined to said side wall and closing the lower end of said container,
said bottom including a generally elliptical bottom wall and a plurality of oriented circumferentially spaced outwardly convexed legs extending from the elliptical wall,
said elliptical wall having a first portion extending downwardly from the lower cylindrical side wall portion and having a radius less than the diameter of the container,
said elliptical wall having a central portion,
each said leg having a first oriented portion extending downwardly from the cylindrical portion of the side wall and having a radius greater than the diameter of the cylindrical portion of the side wall,
a second oriented portion extending downwardly from said first portion of said leg and having a radius substantially less than the radius of said cylindrical portion,
a third oriented portion extending from said second portion defining a flat contacting portion,
a fourth oriented portion extending upwardly and inwardly from said flat portion and being convex outwardly,
a fifth oriented portion blending with said fourth portion and the central portion of the bottom wall,
the radius of said fourth portion being greater than the radius of said second portion,
the first and second portions of each said leg defining an outwardly extending convex surface,
each said leg having diverging oriented side wall portions merging radially inwardly with the elliptical wall portion of the bottom wall.

4,294,367
CONTAINER HAVING RIMMED SHRINK CAP

Chikao Otsuka; Reinosuke Hara, both of Kashiwa, and Yoshito Shigenaka, Tokyo, all of Japan, assignors to Asahi Breweries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 833,682, Sep. 15, 1977, abandoned. This application May 17, 1979, Ser. No. 39,888
Claims priority, application Japan, Sep. 21, 1976, 51-113317
Int. Cl.³ B65D *41/54, 41/62;* **B67B** *5/00*
U.S. Cl. 215—246 **8 Claims**

1. In combination with a container having a tubular neck and a mouth at the upper end of said neck, a rimmed shrink cap comprising a disc-shaped cover having a diameter which is from 10 to 40% larger than the outer diameter of the mouth of the container, said cover being made of a nonshrinkable material, a tubular skirt overlying the top surface of said cover and extending downwardly from the perimeter of said cover, said skirt being made of a heat-shrinkable material, said cap being positioned so that said cover is substantially concentric with and overlies and closes the mouth of the container, and the lower portion of said skirt surrounds the tubular neck of the container and is heat-shrunk into tight sealing contact with the exterior wall of the tubular neck of the container below the

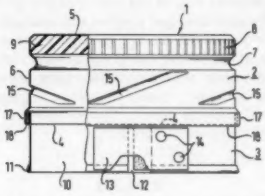


mouth, the outer edge portion of said disc-shaped cover projecting radially outwardly beyond the outer edge of the mouth and forming an annular rim above said mouth, the upper portion of said skirt being exposed to but spaced outwardly from the outer edge of said tubular mouth and the outer surface of the portion of said neck adjacent to said mouth, said rim allows said cap to be readily torn off with ones fingers.

4,294,368
METAL SEALING CAP

Manfred Bodenbender, Kirchhain; Willy Reinhardt, Burgeln, and Hermann Ritzenhoff, Marburg, all of Fed. Rep. of Germany, assignors to Firma Hermann Ritzenhoff, Marburg an der Lahn, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,466
Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2906065
Int. Cl.³ B65D *41/32*
U.S. Cl. 215—256 **12 Claims**



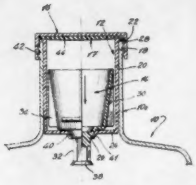
1. A metal sealing cap consisting of a cap upper part and a cap lower part removable from said cap upper part with aid of a tear-off band and by means of which cap lower part the sealing cap is securely sealed with the container by flanging in, the cap upper part of said sealing cap being removable from the container by rupturing a line of weakened strength connecting the cap upper part with the cap lower part, wherein the skirt of the cap upper part bordering on the line of weakened strength has been constructed as a folded area of at least three overlapping thicknesses of material, a first and second outer layer of material in the folded area forming a closed fold downwards and the second layer forming together with an inner third layer a closed fold upwards, the third inner layer of material being bounded at its lower perimeter by the line of weakened strength, characterized in that the line of weakened strength is axially overlapped by the lower edge formed by the downwardly closed fold of the two outerlayers of material, whereby upon rupture along the line of weakened strength, the downwardly closed fold circumferentially encloses the edge along which the line was ruptured.

4,294,369

LIQUID DISPENSING RECEPTACLE

Pierre Racine, 4801, rue Rachel, Pierrefonds, P. Q., Canada (H8Y 2C6)

Filed Jan. 21, 1980, Ser. No. 115,247
Claims priority, application Canada, Dec. 20, 1979, 342373
Int. Cl.³ E03D *9/03*
U.S. Cl. 215—311 **5 Claims**



1. A fluid-tight receptacle for ultimate use in the automatic and periodic dispensing of a liquid into a flush tank or the like, comprising:

(a) a container having a body with a neck portion, said neck portion having a mouth with an upper edge;

(b) a cup-shaped member tightly engaged in said neck portion, said member having a side wall with an annular rim extending at said upper edge of said neck portion of said container, said cup-shaped member including a bottom end wall with an axial opening therethrough;

(c) a cap threadedly engaged exteriorly with said neck portion, said cap having a flat circular inner top wall;

(d) a resilient liner tightly received in said cap on said top wall thereof; and

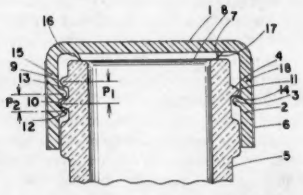
(e) a float member slidably mounted relative to said cup member, said float member including a cup portion concentrically mounted within said cup-shaped member and a lower stem portion slidable through said opening of said bottom end wall; said stem portion including an enlarged end portion adapted to abut against said bottom end wall whereby movement of said float member in said cup-shaped member and of the stem portion in the opening is limited by said enlarged portion and said cup portion; said cup portion having an upper edge extending at a level which is at or below the level of said rim of said cup-shaped member, whereby tight engagement of said cap with said container results in sunken engagement of said rim in said resilient liner to thereby prevent fluid leakage from said cup-shaped member.

4,294,370

THREADED CLOSURE AND CONTAINER

Thurston H. Toeppen, Lois La. R.D. 3, Poughkeepsie, N.Y. 12603

Filed Mar. 24, 1980, Ser. No. 133,536
Int. Cl.³ B65D *41/04*
U.S. Cl. 215—329 **5 Claims**



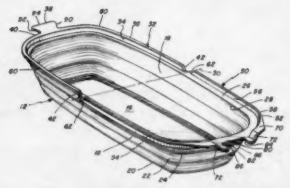
1. A closure device of resilient material, in combination with a container having an external screw thread of less resilient material, comprising: a circular crown disc, a cylindrical sidewall or skirt depending from said disc and perpendicular to it, an internal screw thread within said sidewall to mate with said external screw thread, and sealing means integral with the inside surface of said crown disc for mating contact with the upper rim of the opening of said container; said internal thread having an initial axial pitch shorter than the initial axial pitch of said external thread by an amount proportional to the difference in the effective elasticities of said materials and to the axial pitch of said external thread.

4,294,371

SUNDAE DISH

Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.

Filed Jan. 10, 1980, Ser. No. 111,102
Int. Cl.³ B65D *1/22*
U.S. Cl. 220—4 E **7 Claims**



1. A thin-walled plastic sundae dish adapted to mate with a second identical dish so that one may serve as a cover for the other comprising:

a bottom wall and an upstanding continuous side wall,

an outwardly extending substantially horizontal flange attached to the top of the side wall about its periphery,

upstanding first and second beads formed on the flange and each extending about approximately one half the periphery of the flange, said first and second beads being substantially a continuation of one another so that the two together extend about the full periphery of the flange,

said second bead being positioned on the flange so that its inner side is disposed outwardly from the center of the dish beyond the outer side of the first bead,

and a male latching member formed at one end of the flange as an extension of the first bead and a female latching member formed at the other end of the flange and interrupting the second bead whereby when two identical dishes are placed flange to flange with the male and female latching members of the two dishes registering with one another, the second bead of each dish lies outside the first bead of the other dish to form a skirt about the closed container formed by the two dishes and the male and female latching members are positioned to engage one another and hold the two dishes together.

4,294,372

SMALL-SIZED CONTAINER CAPABLE OF MIXING MORE THAN TWO COMPONENTS AT A PREDETERMINED MIXING RATIO

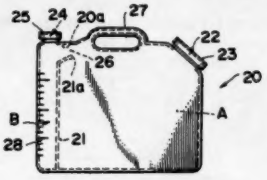
Shigeru Onishi, Kanazawa, Japan, assignor to Nippon Clean Engine Laboratory Co., Japan

Filed Oct. 29, 1979, Ser. No. 89,041
Claims priority, application Japan, Nov. 3, 1978, 53-135949
Int. Cl.³ B65D *1/24, 88/56*
U.S. Cl. 220—20 **1 Claim**

1. Container apparatus for storing at least two components and for mixing the same according to a predetermined ratio, comprising:

means for defining at least two chambers, each chamber having a hollow interior space defined therewithin, and

wherein the ratio of the cross-sectional areas of the interior spaces of said at least two chambers is substantially constant at any level of the apparatus when the latter is oriented in a storage position, said chamber defining means including a container having bottom, side and upper walls and a partition wall located within said container, said partition wall having connected to said container bottom and side walls along its bottom and side edges respectively to define said at least two chambers, said partition wall having a top edge which is spaced below the upper wall of said container, the space defined between said partition wall top edge and said upper wall



of said container forming a passage interconnecting said hollow interior spaces of said at least two chambers with each other;

at least two opening means formed in said container, each opening means communicating with only a respective one of said at least two chambers when the apparatus is oriented in the storage position, whereby each respective component can be charged into the hollow interior space defined by a respective chamber through the respective openings means communicating therewith; and

at least two lid members, each of said lid members being adapted to close a respective one of said openings means.

4,294,373

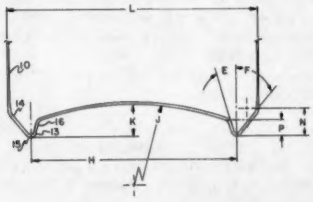
LIGHTWEIGHT METAL CONTAINER

Edward C. Miller, Broomfield, and David A. Straw, Lakewood, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 962,493, Nov. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 900,411, Apr. 26, 1978, abandoned. This application Jun. 16, 1980, Ser. No. 159,733

Int. Cl.³ B23K *9/00*

U.S. Cl. 220—70 **10 Claims**



1. A lightweight aluminum-base alloy container capable of withstanding a substantial internal pressure without eversion comprising a unitary structure having a seamless cylindrical side wall and a bottom wall integrally formed with the side wall at the lower extremity thereof, the ratio of the thickness of said bottom wall to the thickness of said side wall being 3.0 or less, said bottom wall comprising a tapering surface extending downwardly from the side wall, said tapering surface forming a taper angle of between 1.3° and about 2.2° and a wall taper thickness of between about 0.006 inch and about 0.010 inch in excess of the side wall, an outer frustoconical surface extending downwardly and inwardly from said side wall toward the axis of said container, said outer frustoconical surface forming a bottom angle of between about 35° and about 45° with respect to the axis of the container, a bottom radius integrally connected with and extending downwardly from said outer frustoconical surface providing an annular supporting surface of the container, said annular supporting surface having a diameter in the range of about 2.05 inches to about 2.2 inches, an inner frustoconical surface integrally connected with said bottom radius and extending upwardly and inwardly from said annular supporting surface toward the axis of the container, said inner frustoconical surface forming an angle in the range of about $12° \pm 4°$ with respect to the axis of the container, the height of said inner frustoconical surface being less than half the height of said outer frustoconical surface, and a downwardly concaved center panel integrally connected with said inner frustoconical surface and extending upwardly and inwardly from said inner frustoconical surface to the axis of said container, the radius of curvature of said downwardly concaved center panel being between about 2.250 inches and about 3.000 inches, said center panel extending at its uppermost portion slightly above said height of said outer frustoconical surface.

4,294,374

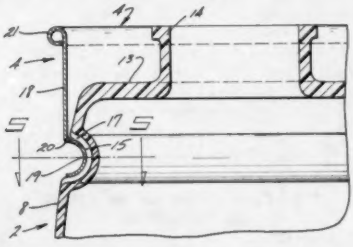
PLASTIC DRUM ASSEMBLY

Geoffrey C. Ames, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 636,272, Nov. 28, 1975, abandoned. This application Feb. 8, 1978, Ser. No. 876,081

Int. Cl.³ B65D *1/46, 6/34, 25/22*

U.S. Cl. 220—71 **17 Claims**



1. A plastic drum assembly comprising a single piece blow molded plastic drum having a top end panel, a bottom end panel, and a circumferential sidewall joining said top and bottom end panels, said top end panel defining at least one opening therethrough, said sidewall including a horizontal circumferential recess adjacent said top end having a substantially semi-circular cross section and at least one arcuate substantially vertical drain channel formed in the surface of said recess and a split metal collar mounted on said drum having a vertically disposed wall portion including a substantially circumferential inwardly extending projection adjacent the lower margin of said vertically disposed wall portion, said inwardly extending projection having a substantially semi-circular cross section positioned within and in snug contact with said recess, said metal collar further including a substantially circumferential rolled annular bead disposed adjacent the upper margin of said vertically disposed wall portion, said annular bead located above said top end, whereby said metal collar and drum are movable by chime-gripping drum handling devices.

4,294,375

VEHICLE FUEL TANK SEALING CAP

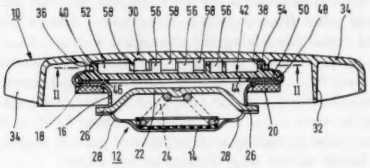
Thedor Gerdes, Langenfeld, Fed. Rep. of Germany, assignor to Blau KG Fabrik Fur Kraftfahrzeugteile, Fed. Rep. of Germany

Filed Dec. 4, 1979, Ser. No. 100,159

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852454

Int. Cl.³ B65D *41/06, 51/18*

U.S. Cl. 220—293 **6 Claims**



1. In a sealing cap, for the fuel tank pipe of a motor vehicle, comprising:

(i) an outer cap **10**

(ii) an inner cover portion **12**, said inner cover portion **12** being cup-shaped and having a peripheral flange **18** at its side facing the outer cap **10**, said cover portion **12** carrying packing means to form a seal with the fuel tank pipe, said cover portion **12** further comprising fastening means **22** for engagement with the fuel tank pipe, said outer cap **10** at its side facing the inner cover portion **12** including an integrally molded rib **36** of synthetic material having at its free end at least one inwardly-directed radial lug **38** engaging said inner cover portion **12**, said outer cap **10** being adapted to snap off from said inner cover portion **12** under the influence of forces exerted on it as a result of a motor vehicle accident,

the improvement which comprises:

(a) the strength of the lug **38** is selected such that it is adapted to break under the influence of said forces,

(b) positive anti-rotational coupling means **56**, **58**, **70**, **72** to prevent relative rotation between said inner cover portion **12** and said outer cap **10** and provided respectively on said inner cover portion **12** and on said outer cap **10**.

4,294,376

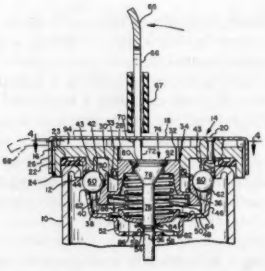
FUEL TANK CAP

Russell D. Keller, 1750 SE. Risley, Milwaukie, Oreg. 97222

Filed Jan. 3, 1980, Ser. No. 108,448

Int. Cl.³ B65D *45/00*

U.S. Cl. 220—318 **8 Claims**



1. A fuel tank cap comprising:

a cap body adapted to form a closure on the outer end of a fuel tank neck,

a housing member depending from underneath said cap body and provided with movable means comprising a plurality of balls for selectively engaging the underside of an inner lip of the fuel tank neck when said cap body is positioned on said fuel tank neck,

an actuating member for operating said movable means for moving the same between first and second positions into and out of engagement with the inner lip of the fuel tank neck,

and a manually operable control element on the outer side of said cap body for causing said actuating member to operate said movable means between said first and second positions.

4,294,377

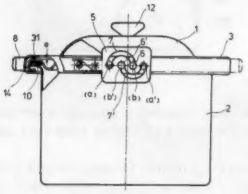
CONSTANT PRESSURE COOKER AND FASTENER

Shin-I. Chen, No. 5, 102 La., Ho-Chiang St., Taipei, Taiwan

Filed Mar. 14, 1980, Ser. No. 130,341

Int. Cl.³ B65D *45/34*

U.S. Cl. 220—321 **12 Claims**



1. A constant pressure cooker, comprising:

a cooker body having a protruding edge portion;

a cover having an exterior margin curved inward and under the cover to form a cover groove, the exterior margin being shaped so as to mate with the protruding edge portion of the cooker body when the cover is placed on the cooker body;

a thermal resistant rubber material placed within the cover groove; and

a coupling ring having a gap therein and having a cross sectional shape for clamping the protruding edge portion of the cooker body to the exterior margin of the cover and fabricated from a flexible metal material such that for pressures within the cooker below a predetermined threshold, the edge portion of the body is held tightly to the exterior margin of the cover, but for pressures within the cooker at or above the predetermined threshold, the cross-section of the ring deforms and allows the exterior margin of the cover to separate from the edge portion of the cooker body so that pressurized gases can escape from the cooker; and

means for adjusting the size of the gap to clamp and unclamp the coupling ring.

4,294,378

SAFETY HATCH COVER APPARATUS

Evsey Rabinovich, Erie, Pa., assignor to Emco Wheaton Inc., Conneaut, Ohio

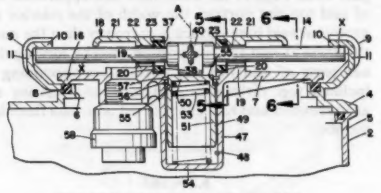
Filed Feb. 4, 1980, Ser. No. 118,647

Int. Cl.³ B65D *45/28*

U.S. Cl. 220—323 **14 Claims**

1. Hatch cover apparatus for a tank comprising a base member fixed to the tank having an opening providing access to the tank; a pair of keeper members mounted on the base member at opposite sides of said opening, each keeper member providing lateral access for an end portion of a latch bar; a cover associated with the base member and adapted to be put in closed position to engage the base member and close the opening and to be put in opened position to open the opening; an elongated latch bar adapted to have its ends engage with the keeper members when the cover is in closed position and be disengaged from the keeper members when the cover is in opened

position; means on the cover for mounting a latch bar on the cover so that it is capable of limited movement to engage and disengage from said keeper members and of rotation about its longitudinal axis, said latch bar being thus movable between a position in which its ends are engaged with the keeper members and another position in which its ends are not so engaged; a cam affixed to the latch bar and adapted to be rotated about the longitudinal axis of the latch bar, said cam having a projecting external surface portion that is located a maximum distance from the latch bar axis and toward the cover when the cover is in its closed position and retracted external surface portion



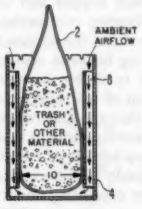
located at lesser distance from the latch bar axis and away from the cover when the cover is not in the closed position; resilient biasing means operating by cooperation with the cover, the cam, the latch bar, and the keeper members to urge the cover toward the base member when the cover is closed and the latch bar ends are engaged with the keeper members, yet when gas pressure above a predetermined amount exists within the receptacle and generates a force on said cover against the biasing force of said biasing means, said biasing means will permit at least a portion of the cover to lift from the base member and permit escape of such gas from the tank.

4,294,379

UPWARD VENTED TRASH RECEPTACLE FOR FLEXIBLE COLLAPSIBLE TRASH LINER

Robert A. Bard, 70 Hopatcong Dr., Lawrenceville, N.J. 08648

Filed Aug. 27, 1979, Ser. No. 70,179
Int. Cl.[3] B65D *25/16*
U.S. Cl. 220—404 **4 Claims**



1. An apparatus for receiving a flexible and collapsible trash liner comprising:

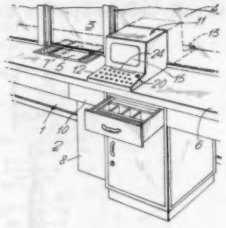
a rigid upward vented trash receptacle having a main body with a closed bottom; a collapsible trash liner; and an open top with a rim containing circumferentially positioned notches for assisting the escape of air trapped between the walls of said main body and said trash liner; said main body including along its side walls a plurality of axially aligned hollow open ended conduits positioned in the corners of said main body and spaced sufficiently from said bottom and top of said receptacle to permit trapped air to flow out of said trash receptacle during the filling of said liner and to permit ambient air to flow into said trash receptacle as the liner is removed from said receptacle so as to reduce the vacuum created in the void between the exterior of said liner and the interior of said receptacle.

4,294,380

TELLER MACHINES AND METHODS OF OPERATION THEREOF

Kenneth F. Rankin, St. Albans, England, assignor to Chubb Integrated Systems Limited, Brighton, England

Filed May 21, 1979, Ser. No. 40,786
Int. Cl.[3] E05G *7/00*
U.S. Cl. 221—195 **2 Claims**



1. A teller machine for use at a transaction location for delivery of items in accordance with a customer-requested transaction at that location, comprising transaction-counter means having a counter-surface for separating the customer from a human teller at the transaction location and across which counter-surface face to face personal service to the customer can be provided by the human teller, means including a first keyboard for defining a teller's station located to one side of the counter means, means including a second keyboard for defining a customer's station separated from the teller's station across the counter-surface, item-receptacle means located intermediate the customer's and teller's stations across the counter-surface, said receptacle means having a top opening within reach of the customer and the human teller when occupying their respective stations for access to the contents of said receptacle means, dispenser means operable to dispense items through an opening in a wall of said receptacle means different from said top opening for subsequent delivery via said top opening from the receptacle means to said customer, control means for controlling operation of said dispenser means, said control means being switchable selectively to a first mode in which it is responsive to operation of said first keyboard to operate said dispenser means under manual control from said first keyboard, or to a second mode in which the control means operates said dispenser means under machine control in dependence upon data entered via said second keyboard, and means operable from said teller's station to obstruct or enable, selectively, access from said customer's station via said top opening to the contents of said receptacle-means.

4,294,381

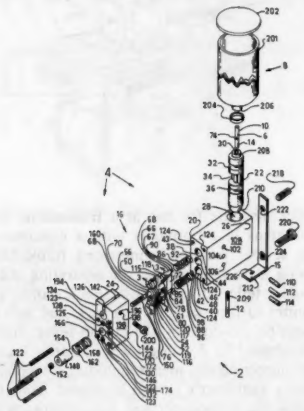
DISPENSER FOR AND METHOD OF DISPENSING A MATERIAL FROM A NON-PRESSURIZED MATERIAL RESERVOIR

Kenneth L. Miller, 7345 N. Meridian St., Indianapolis, Ind. 46260

Continuation-in-part of Ser. No. 668,417, Mar. 18, 1976, Pat. No. 4,095,722. This application Jun. 15, 1978, Ser. No. 915,874
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.
Int. Cl.[3] B65D *37/00*
U.S. Cl. 222—1 **21 Claims**

1. A material dispenser for dispensing a material from a non-pressurized material reservoir comprising a resilient pinch-off tube having opposite ends, one end of said pinch-off tube being removably coupled to said reservoir, a nozzle removably coupled to other end of said pinch-off tube, said nozzle being in communication with said reservoir through said tube, and squeezing means, operative with said tube, for selectively forcing a selected amount of said material out of said tube and nozzle and drawing said material from said noz-

zle into said tube, said squeezing means including an upper ram and an intermediate ram and a lower ram, each of said rams being selectively movable from a first position in which said ram is disengaged from said tube to a second position in which said ram engages and compresses said tube and back from said second position to said first position, said squeezing means further including means for positioning said rams and means, operative with said ram positioning means, for sequencing the movement of said rams to, firstly isolate said material in said tube by positioning said upper and lower rams in said second position thereof, secondly dispense a portion of said material in



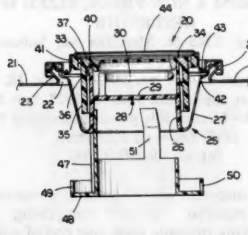
said tube by positioning said upper ram in said second position thereof, and said lower ram in said first position thereof, and squeezing said tube by moving said intermediate ram from said first position thereof toward said second position thereof, thirdly withdraw said material from said nozzle into said tube by positioning said lower ram in said first position thereof and positioning said upper ram in said second position thereof, and positioning said intermediate ram in said first position thereof, and fourthly fill said tube from said reservoir by positioning said intermediate and upper rams in said first position thereof and said lower ram in said second position thereof.

4,294,382

CONTAINER CLOSURE DEVICE

Kenneth L. Summers, Angola, and Mahlon E. Rieke, Auburn, both of Ind., assignors to Riche Corporation, Auburn, Ind.

Filed Jul. 26, 1979, Ser. No. 60,971
Int. Cl.³ B67D *3/00*
U.S. Cl. 222—529 **1 Claim**



1. A cap-like closure device for a container of the type including a flexible spout member having a substantially cylindrical top rim portion and an outer edge portion and extendable from a nested orientation to a pouring orientation, an anchor ring for securing the outer edge portion of the flexible spout member to the container, a first cap for engaging the top rim portion and closing said spout member, and a tamper-proof cap disposed over and removable from the top of said first cap, wherein the improvement comprises:

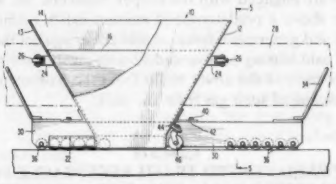
an interior annular groove disposed in a top lip portion of said first cap and including a base surface at the uppermost end, said interior annular groove opening downwardly toward said top rim portion of said flexible member, wherein said interior annular groove narrows as it extends upwardly away from the top rim portion of said flexible spout member, and wherein said top rim portion has an upwardly and outwardly inclined top surface which tapers to an edge at the outermost and uppermost location of said top rim portion, the width of the interior annular groove at said base surface is narrower than the maximum thickness of said top rim portion thereby forcing the thinner parts of said top rim portion corresponding to the inclined top surface to curl into said interior annular groove when said first cap is fitted onto said flexible spout member.

4,294,383

MORTAR APPLYING DEVICE

Rodney J. Hession, and Brent M. Hession, both of New Orleans, La., assignors to Hession Industries, Inc., New Orleans, La.

Filed Jan. 18, 1980, Ser. No. 113,325
Int. Cl.³ B05D *1/26, 1/30;* **F04G** *21/16*
U.S. Cl. 222—611 **5 Claims**



1. A device for applying mortar to a course of masonry units having side faces and a top surface, comprising a hopper formed with side members and end plate members and having an open top and bottom, plate members defining a divider mounted within said hopper and defining a pair of mortar receiving and delivering compartments communicating with the open top and bottom, the portion of said end plate members of said hopper lying between said plate members of said divider are formed to define an elongated recess extending through the bottom of said hopper, a wheeled undercarriage chassis entending through said recess and fastening means on said hopper for securing same to said chassis for moving said hopper over the top surface of a course of masonry units and semi-cylindrical guide members secured to said hopper in trailing relation for depositing uniform beads of mortar upon said surface, contemporaneous with the moving of said hopper.

4,294,384

LIQUID DISPENSER HOLDER

Terrence D. Howell, Apt. 214, 3395 Yankee Doodle Rd., Eagan, Minn. 55121

Filed Oct. 25, 1977, Ser. No. 844,632
Int. Cl.³ B60N *3/10, 3/18*
U.S. Cl. 224—42.42 **1 Claim**

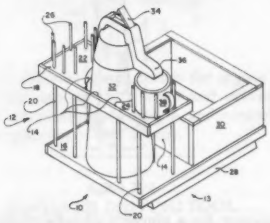
1. A liquid dispenser holder, comprising:

(A) a cradle for receiving and holding a liquid dispenser such as an Air Pot, which cradle includes a cradle base having a planar member for setting thereon of a dispenser and a collar supported vertically above the base for at least partially encircling the upper portion of a said dispenser to prevent the dispenser from tipping;

(B) cradle attachment means adapted to hold the cradle stationary when the cradle is on a vehicle seat, transmis-

sion shroud, or floor, which attachment means includes a pair of planar leg members rigidly attached to and depending from said cradle base and diverging from each other in two directions, which leg members are longitudinally elongate, closer together at one end than the other and closer together at their juncture with said cradle base than at their bottoms to form a saddle for securely engaging a transmission shroud graduating dimensionally either longitudinally or vertically;

(C) a ballast compartment supported by said base for accepting ballast or utilitarian articles of sufficient weight to stabilize said cradle; and



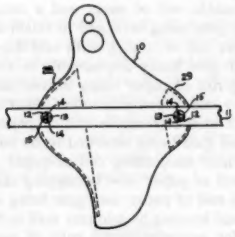
(D) receptacle holding means for supporting a receptacle in position under and to receive a fluid from an Air Pot dispensing spout, which holding means includes a platform which in turn is an extension of said collar and has at least one receptacle filling station having means for releasably engaging a receptacle such as a coffee mug and which receptacle holding means is supported vertically above said cradle base, whereby all the steps for filling a receptacle from a dispenser such as an Air Pot can be accurately and safely performed with only one hand.

4,294,385

RAPIDLY SEPARABLE HOLSTER AND HOLSTER-CARRYING BELT

William H. Rogers, Jacksonville, Fla., assignor to Alpha Plastics, Inc., Jacksonville, Fla.

Filed Feb. 25, 1980, Ser. No. 124,658
Int. Cl.³ F41C *33/02*; F41B *13/04*
U.S. Cl. 224—240 **13 Claims**



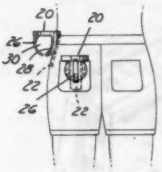
1. A rapidly separable holster and holster-carrying belt comprising a holster with two spaced upstanding pins on the side of the holster next to the body of the person wearing the holster, said pins comprising a shank and a generally flat head of substantially larger diameter than the diameter of said shank; and a belt having on the inside surface thereof two rigid slotted plates spaced apart substantially the same distance as the distance between said pins, each of said plates and the contiguous portion of the belt being perforated with a slot, one end of which is slightly larger than the diameter of said head and the other end of which has a diameter larger than the diameter of said shank and smaller than the diameter of said head, said slots being oriented with the lengthwise axis of the slot substantially parallel to the lengthwise axis of the belt and with the distance between the smaller ends of the slots being less than the distance between the larger ends of the slots.

4,294,386

TENNIS BALL HOLDER

Arlen E. Ingram, 32606 Barkley, Livonia, Mich. 48154

Continuation of Ser. No. 912,446, Jun. 5, 1978, abandoned. This application Jan. 25, 1980, Ser. No. 115,386
Int. Cl.³ A45F *5/00*
U.S. Cl. 224—252 **5 Claims**



1. A tennis ball holder attachable to the garment of a player and constructed and arranged to receive and hold only one tennis ball at a time, comprising a homogeneously integral one-piece body of a plastic material having a retainer ring which is flexible, resilient, formretaining, and can be disposed in a generally horizontal plane with its central axis extending generally vertically, a plurality of discreet and generally circumferentially spaced apart fingers each at its proximal and homogeneously integral with said ring and depending normally generally downwardly from said ring and having its distal end curved generally inwardly of said ring toward its center axis and terminating at a point spaced from said center axis and the distal end of the other of said fingers, each said finger being flexible, resilient, form-retaining, and constructed and arranged so that its distal end, in the unflexed position of such finger, underlies and supports a single tennis ball inserted through said ring and can be yieldably moved away from said center axis to allow the tennis ball to be manually pushed generally downwardly beyond the distal end, out of the holder and into the fingers and hand of a user by pressure manually applied to the top of the tennis ball by the thumb of the same hand of the user extending through said ring, said ring being constructed, arranged, and dimensioned to yieldably permit the tennis ball to pass therethrough and into engagement with said flexible fingers and in its normal unflexed state to retain the tennis ball between said ring and said fingers, and a tab homogeneously integral with said ring and being constructed and arranged for attaching the holder to the garment of a tennis player.

4,294,387

CONVERTIBLE SKI CARRYING APPARATUS

Kenneth A. Wnek, 282 Valley Park South, Bethlehem, Pa. 18018

Continuation-in-part of Ser. No. 921,969, Jul. 5, 1978, Pat. No. 4,171,759. This application Jun. 25, 1979, Ser. No. 51,516
Int. Cl.³ B60R *9/12*
U.S. Cl. 224—315 **10 Claims**

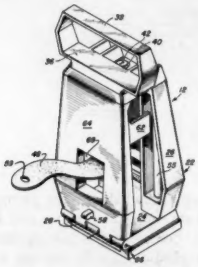
1. A convertible carrier for skis comprising:

(a) a generally L-shaped housing including a floor portion and a side portion, said floor portion having sufficient length and width to receive at least one pair of skis resting in parallel juxtaposition, and where said skis are supported on their longitudinal edge by said floor portion, said side portion being of sufficient height to provide lateral support for said skis, said floor portion also including a transverse opening, said opening being of a shape and size to permit the insertion therein of a bracket plate which is separate from said housing;

(b) retainer means for said skis of the same proximate size

and shape as said side portion, hingeably connected at its proximal end to said floor portion and at its distal end adapted to interface with a handle means whereby said carrier may be opened or closed;

(c) handle means to provide hand carrying of said carrier said handle means adapted to mate with said retainer means so that said handle means together with said floor portion, side portion and retainer means define a total closure for said skis and said poles, said handle means also including at least one shank portion containing at least one recess positioned intermittent its length to receive an extension bar section of a locking mechanism;



(d) bracket means, including at least one bracket plate, adapted to be affixed to a vehicle, said bracket plate adapted to slidably mate within said housing transverse opening, said bracket plate including at least one opening to receive and permit passage therethrough of said shank whereby when an end of a shank extends into an opening, sliding of said carrier from said bracket plate is prevented; and,

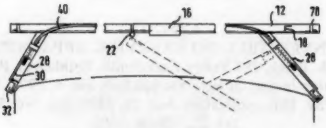
(e) locking means interconnected with said handle means and said shank so that when said shank is slidably mounted in said housing, said extension bar section operably connects with said locking mechanism so that unlocking of said locking mechanism operates to release said extension bar section from a recess of said shank.

4,294,388

CAR TOP CARRIER SUPPORT

Franz Wünstel, Morellstr. 1, D-8900 Augsburg, Fed. Rep. of Germany

Filed Aug. 11, 1980, Ser. No. 177,445
Int. Cl.³ B60M *9/04*
U.S. Cl. 224—315 **10 Claims**



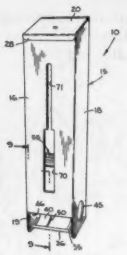
1. A car top carrier support comprising a substantially H-shaped frame, the frame consisting of a pair of parallel hollow tubes and at least one hollow tube cross-wise extending therebetween, at least four legs arranged at the frame and extending downwardly, the legs standing on the car top edge or the gutter of which, a claw associated with each leg and connected with a slide, the slide being movably guided in the leg for a reciprocating motion; a central hand operating means arranged at the frame and a set of at least four driving means, each one of the driving means being connected at its one end with one of the claws and at its other end with the central operating means.

4,294,389

DISPENSER FOR ROLLS OF PAPER

Filip Falk, Hammarbacken 22, S-182 35 Danderyd, and Lennart Falk, Visborgsgatan 16, S-621 00 Visby, both of Sweden

Filed Sep. 7, 1979, Ser. No. 73,270
Claims priority, application Sweden, Sep. 13, 1978, 782101
Int. Cl.³ B26D *1/02*; B26F *3/02*
U.S. Cl. 225—34 **5 Claims**



1. A dispenser for a plurality of rolls of paper or the like comprising:

(a) a longitudinally extending hollow housing having a rear wall, a front wall and confronting side walls;

(b) means at an upper section of said housing for depositing in said housing a column of rolls of paper, said column of rolls of paper extending in the longitudinal direction of said housing with the axes of said rolls of paper extending in parallel relation between said side walls and transversely of said housing;

(c) said front wall and said side walls at a lower section of said housing forming a paper exit opening for said housing;

(d) said housing being formed with a wall at the lower section thereof on which a dispensable roll of paper is seated for rotation, said dispensable roll of paper being a lower roll of said column of rolls of paper, said dispensable roll of paper having the free end thereof projecting through said paper exit opening;

(e) a cutting edge extending transversely across said paper exit opening for severing the free end of the dispensable roll of paper from the remainder of the roll of paper; and

(f) a gate supported in said housing by said rear wall between said dispensable roll of paper and a succeeding roll of paper, said gate being arranged to retain said succeeding roll of paper out of contact with said dispensable roll of paper, said gate being displaceable in response to said succeeding roll of paper being moved into the position occupied by said dispensable roll of paper after the supply of paper of said dispensable roll of paper has been expended, said gate being returned to its initial position to retain the next succeeding roll of paper out of contact with the roll of paper now occupying the position of a dispensable roll of paper, said gate being adjustably supported in said housing by said rear wall in the longitudinal direction for accommodating rolls of paper of various diameters in maintaining the succeeding roll of paper out of contact with the dispensable roll of paper.

4,294,390

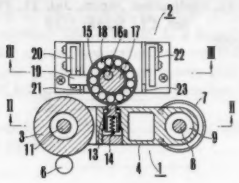
PINCH ROLLER MECHANISM

Takeshi Toriumi, Sagamihara, and Tamotsu Tominaga, Akishima, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,377
Claims priority, application Japan, Oct. 23, 1978, 53-146353
Int. Cl.³ B65H *17/22*
U.S. Cl. 226—181 **3 Claims**

1. A pinch roller mechanism comprising a source of rotary

motion, an eccentric cam coupled to said source of rotary motion and adapted to be rotated by said source, a capstan shaft, a pinch roller, an arm normally urged against the side surface of said eccentric cam and supporting said pinch roller,



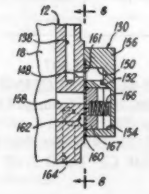
spring means of different spring forces for urging said pinch roller against said capstan shaft when said eccentric cam is rotated by said source of rotary motion, and control means for controlling energization of said source.

4,294,391

FASTENER DRIVING TOOL

Allen R. Obergfell, Park Ridge, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.

Filed Oct. 31, 1979, Ser. No. 89,878
Int. Cl.³ B25C *1/04*
U.S. Cl. 227—130 **13 Claims**



1. In a fastener driving tool including a housing defining a reservoir for pressurized fluid, a nose portion and a handle portion, a driver mounted in said nose portion, means for driving said driver through a driving stroke, the improvment comprising

means for returning said driver to a static position, said returning means comprises a chamber, first and second inlets in said chamber, said first and second inlets in fluid communication with said reservoir, a diaphragm mounted in said chamber and sealing said first inlet, and a first outlet in said chamber in fluid communication with said nose portion below said driver, said diaphragm separates said first inlet and said outlet from said second inlet and controls fluid flow therethrough.

4,294,392

METHOD OF JOINING A PAIR OF METAL PARTS

Nicholas J. Colloff, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

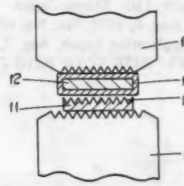
Filed Dec. 28, 1979, Ser. No. 108,129
Claims priority, application United Kingdom, Jan. 16, 1979, 1598/79
Int. Cl.³ B23K *21/00*
U.S. Cl. 228—111 **4 Claims**

1. A method of joining a pair of metal parts wherein:

(a) at least one of the parts is provided with an insulative coating at its surface to be joined to the other part,

(b) at least one of the parts defines a plurality of substantially parallel, longitudinally extending splines at its surface to be joined to the other part, and

(c) the joining surfaces of the parts are urged into interengagement and are simultaneously caused to undergo relative vibrational movement in a direction substantially parallel with said splines.

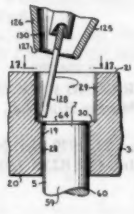


4,294,393

METHOD OF MANUFACTURING A WIRE SPOKE AUTOMOTIVE WHEEL

Richard G. Weld, Independence, Mo., assignor to Weldwheels, Inc., Kansas City, Mo.

Division of Ser. No. 918,606, Jun. 23, 1978, Pat. No. 4,226,479.
This application Sep. 28, 1979, Ser. No. 79,962
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—134 **3 Claims**



1. A method of manufacturing a vehicular wheel rim comprising the steps of:

(a) providing a wire spoke vehicular wheel rim;

(b) providing a felly for said wheel rim and having walls defining spaced bores extending circumferentially thereabout;

(c) providing solid spokes having radially outer ends;

(d) securing said spoke outer ends within said felly bores by:

(1) inserting a spoke outer end partially within a felly bore, thereby leaving a cavity defined by said felly bore atop said spoke outer end with said spoke outer end providing a substantially closed bottom wall of said cavity;

(2) feeding a welding wire into said cavity under wire melting conditions;

(3) substantially filling said cavity with melted welding wire but not overfilling said cavity;

(4) producing a weld formation extending transversely across said spoke outer end;

(5) fusing said spoke outer end to said melted welding wire which is fused to the felly bore wall; and

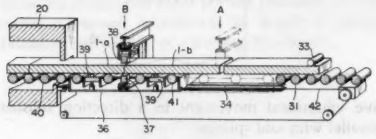
(e) assembling the wheel rim and felly-spoke assembly.

4,294,394

METHOD OF AND APPARATUS FOR CONTINUOUSLY ROLLING STEEL SLABS

Yoshihiko Iida, and Toshiyuki Kajiwara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1979, Ser. No. 63,776
Claims priority, application Japan, Aug. 7, 1978, 53-95479
Int. Cl.³ B23K *37/04*; B21B *1/04*
U.S. Cl. 228—158 **13 Claims**



1. In a process for producing strip by a continuous hot rolling of slab steel including the steps of welding a piece of slab at its leading end to the trailing end of a steel slab while transferring said steel slab by making said piece of slab follow said steel slab, moving said steel slab including successive steel slab pieces welded together in series through a heating furnace to heat said steel slab, and effecting hot rolling of a steel slab by passing said steel slab through a rolling mill to produce a strip;

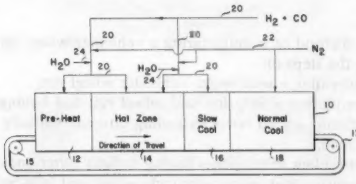
wherein the improvement resides in that said step of welding is made at the boundary surface between the trailing end of said steel slab and said piece of slab which is positioned in abutment at its leading end with said trailing end of said steel slab, over an area which amounts to 1/20 to ½ of the whole area of said boundary surface, and in the further step of shearing said roller strip at said areas of welding after said step of hot rolling.

4,294,395

BRAZING PROCESS

Harbhajan S. Nayar, Murray Hill, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Mar. 23, 1979, Ser. No. 23,377
Int. Cl.³ B23K *1/04*
U.S. Cl. 228—220 **15 Claims**



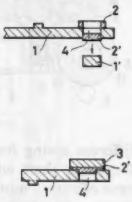
1. A process for copper brazing ferrous parts in a continuous furnace comprising the steps of: heating said furnace to establish a region therein at a temperature of at least 600° C.; establishing an atmosphere in said region under equilibrium conditions in the absence of parts comprised of at least 90% nitrogen, at total of about 1.0 to 7.0% hydrogen and carbon monoxide, wherein the concentration of hydrogen is greater than the concentration of carbon monoxide, and moisture sufficient to provide a dew point of about −40° C. to +10° C.; and passing through said furnace said ferrous parts having thereon a brazing paste comprised of a copper paste and 25–75% of a copper oxide paste whereby said parts are brazed.

4,294,396

METHOD FOR MANUFACTURING BRAZED PARTS

Toshiharu Obata; Toshimasa Hagyu, and Hisao Kojima, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 23, 1979, Ser. No. 59,840
Claims priority, application Japan, Jul. 21, 1978, 53-89257
Int. Cl.³ B23K *1/12*
U.S. Cl. 228—245 **5 Claims**



1. In a method for manufacturing brazed parts made by brazing a metal part with a base material made of a plate metal, the improvement comprising the steps of;

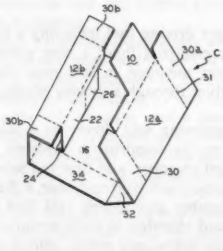
stamping out said base material to form a through-hole in said base material, stamping out said filler material and urging said filler material into said through-hole formed in said base material and held protruding outwardly therefrom, placing said metal part on said filler material and, brazing said metal part to said base material through said filler material.

4,294,397

CARTON WITH SELF ERECTING PARTITIONS

Karl A. Kohler, Roselle, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Jul. 15, 1980, Ser. No. 169,192
Int. Cl.³ B65D *5/48*
U.S. Cl. 229—27 **2 Claims**



1. In a folding carton, formed from a unitary blank of foldable paperboard, including automatically self-erecting interal longitudinal and transverse partition structures, the combination of:

(a) opposed pairs of major and minor side wall panels foldably joined to each other along parallel fold lines to form a tubular structure open at the ends;

(b) opposed pairs of major and minor end closure panels foldably joined to opposite ends of respective major and minor side wall panels, respectively, and adapted to be secured to each other in overlapped relation to close the ends of said carton;

(c) an internal longitudinal partition member including:

(i) a first element secured to and extending between and normal to opposed major side wall panels and disposed parallel to but spaced inwardly from one of said minor side wall panels;

(ii) a second element, having a width greater than that of

said first element, secured at one side to one of said major side wall panels in alignment with said first element, and having its other side extending diagonally toward the junction of said other major side wall panel and said one minor side wall panel and being free from attachment to any of said panels;

(d) an internal transverse partition member being: (i) foldably joined at one end to an edge of said longitudinal element member first element at a location between the ends of said carton and extending transversely from said first element toward said one minor side wall panel between said longitudinal partition member first and second elements;

(ii) supported by an end edge of said longitudinal member second element.

4,294,398

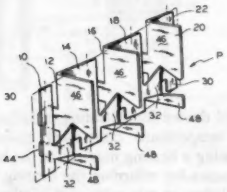
PARTITION FOR CARRIER CARTON

Francis A. Chidsey, Jr., Devon, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 22, 1981, Ser. No. 227,542

Int. Cl.³ B65D *5/48, 71/00, 25/04*

U.S. Cl. 229—15 **1 Claim**



1. In a partition arrangement for separating corresponding areas of adjacent packaged articles, such as bottles, arranged in three side-by-side rows, a pair of partitions, each being formed of a unitary blank of paperboard or the like which is cut and scored to provide:

(a) a plurality of alternately disposed longitudinal members, for interposition between adjacent articles of separate rows, and transverse members, for interposition between adjacent articles of the same row;

(b) each of said members having a relatively narrow main section, extending the entire height thereof, and separator elements projecting laterally outward from opposite sides thereof;

(c) said transverse member each having a pair of separator elements extending from one side of said main section toward upper end, center, and lower end areas of the articles and another pair of separator elements extending from the other side of said main section toward center and one of the end areas of the articles, so that when said partition is used with a similar partition, disposed in an inverted position, the elements extending from said other side of said partition main sections cooperate to prevent contact between corresponding areas of adjacent articles of the center row, at the center and both the upper and lower end areas of said partitions.

4,294,399

FOLDING BOX

Oskar Wilfer, Grünenbach, Fed. Rep. of Germany, assignor to H. F. & Ph. F. Reemtsma, Hamburg, Fed. Rep. of Germany

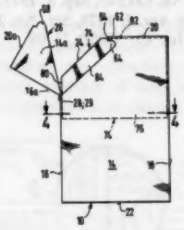
Filed Sep. 21, 1979, Ser. No. 78,585

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841257; Apr. 6, 1979, 2913891

Int. Cl.³ B65D *5/66*

U.S. Cl. 229—44 CB **2 Claims**

1. A unitary folding box for cigarettes and smoking articles comprising a single blank having a front wall, a rear wall, a pair of side walls, an upper wall, a bottom wall, and a cap formed from a portion of said front, side and upper walls which pivots about an axis in the plane of a wall in opening and closing; complementary locking means formed from a portion of said walls, said locking means having rotating locking means



and stationary locking means, one of which is associated with said cap and the other of which is associated with said box, both said rotating locking means and said stationary locking means lying in the same plane as said wall portions from which they are formed.

4,294,400

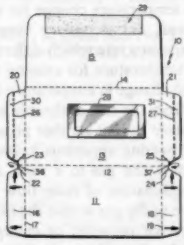
NON-GUSSETED EXPANSIBLE ENVELOPE

Wilfred H. Gendron, Wilbraham, Mass., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 17, 1980, Ser. No. 141,052

Int. Cl.³ B65D *27/00, 30/20;* **B31B** *1/48, 1/62*

U.S. Cl. 229—68 R **6 Claims**



1. A non-gusseted expansible envelope comprising a one piece blank including a substantially rectangular rear panel, a front panel foldably attached thereto along a transverse fold line, a closure flap foldably attached to the front panel along another transverse fold line and two pairs of equally sized and shaped side seam flaps foldably attached respectively to the side edges of the front and rear panels along a pair of longitudinal fold lines, the improvement wherein the side seam flaps attached to the side edges of the front panels are each applied with longitudinal perforated lines which substantially bisect the flaps to form outer portions for the application of adhesive and to provide hinge connections which enable the side seam flaps to be folded inwardly upon themselves when the envelope is expanded.

4,294,401

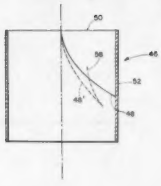
DRAFT CONTROL ARRANGEMENT

Werner Diermayer, 1275 Panorama Dr., Lafayette, Calif. 94549; Luitpold Kutzner, Marschnerstrasse 78, D-8000 Munich, and Erwin Postenreider, Postfach 240, D-8031 Groebenzell, both of Fed. Rep. of Germany

Continuation of Ser. No. 831,547, Sep. 8, 1977, abandoned. This application Apr. 9, 1979, Ser. No. 28,718

Int. Cl.[3] G05D *23/08*

U.S. Cl. 236—1 G 4 Claims



1. In a gas-fired heating apparatus having a draft hood for directing a flow of waste gas to a vent, a throttling device comprising the combination of main flow control means for sensing temperature of the gas within the hood and responding to said temperature for reducing or enlarging the cross-sectional throttle area for directing gas to the vent, said main flow control means including bimetal element means shaped to project across said throttle area and changing shape at a first rate responsive to temperature change for reducing or enlarging the throttle area, and secondary bimetal element means which changes shape, at a rate which differs from the first rate, responsive to gas temperature for causing the rate of throttle area change for unit change in temperature during one phase of operation to vary from the rate of throttle area change for unit change in temperature during another phase.

4. In a gas-fired heating apparatus having a draft hood for directing a flow of waste gas to a vent, a throttling device comprising the combination of main flow control means for sensing temperature of the gas within the hood and responding to said temperature for reducing or enlarging the cross-sectional throttle area for directing gas to the vent, said main flow control means including bimetal element means shaped to project across said throttle area and changing shape responsive to temperature change for reducing or enlarging the throttle area, and secondary control means for causing the rate of throttle area change for unit change in temperature during one phase of operation to vary from the rate of throttle area change for unit change in temperature during another phase, said secondary control means including means forming an opening in the first-mentioned bimetal element means, together with secondary bimetal element means carried by the first element and extending across the opening for reducing or enlarging the flow area therethrough responsive to gas temperature for causing a high rate of throttle area change for unit change in gas temperature during said one phase.

4,294,402

CONTROL DEVICES FOR HEATERS

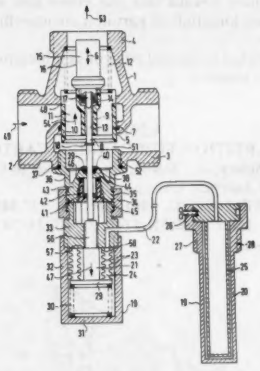
Rudolf Vollmer, Mosbach, Fed. Rep. of Germany, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 23, 1978, Ser. No. 953,453

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747969

Int. Cl.[3] G09D *23/13*

U.S. Cl. 236—12 R 13 Claims



1. A control device for a heating installation including one individually temperature controlled radiator means, first means for passing a heating medium to the heating installation and second means for returning the heating medium from the heating installation to mix with said heating medium passing into said heating installation, moveable means in said first and second means and control means actuable in response to the temperature of said heating medium and returning heating medium, said control means operating on said moveable means to vary inversely the flow of said heating medium as compared to the returning heating medium to maintain a pre-determined temperature drop between the heating medium passing to said radiator means and returning therefrom, said control means including a first thermostatic working element having a sensor for determining the temperature of the heating medium being passed to the heating installation and a second thermostatic working element having a sensor for determining the temperature of the heating medium being returned from said heating installation.

4,294,403

SYSTEM AND METHOD FOR CONTROLLING THE CONDITIONING AND DELIVERY OF AIR TO A CONDITIONED SPACE

Staron E. Ammons, P.O. Box 17128, Dallas, Tex. 75217; Edwin L. Paschall, P.O. Box 35226, Dallas, Tex. 75235, and Morris G. Carter, P.O. Box 17128, Dallas, Tex. 75217

Continuation-in-part of Ser. No. 958,961, Nov. 9, 1978, abandoned. This application Jul. 21, 1980, Ser. No. 170,996

Int. Cl.[3] G05D *23/13*

U.S. Cl. 236—13 19 Claims

1. A system for controlling the conditioning and delivery of air to a conditioned space comprising

a cool air duct for connection to a cool air supply duct;

a warm air duct for communication with a return plenum;

a delivery duct connected to both said cool air and warm air ducts for delivering air to the conditioned space;

a thermostat control device for providing a varying control signal related to the varying temperature of the air in the conditioned space;

coupled discharge damper means for said cool air duct and said warm air duct, shiftable between a first condition wherein said cool air duct is open and said warm air duct

is closed, and a second condition wherein said cool air duct is closed and said warm air duct is open;

a fan disposed in said warm air duct for effecting air flow from the return plenum to said delivery duct;

a variable flow control device disposed in said cool air duct for varying the air flow therein between maximum and minimum flow conditions;

first actuator means responsive to said thermostat signal for controlling said variable flow control device;

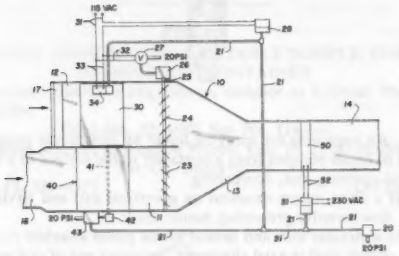
second actuator means responsive to said thermostat signal for controlling said discharge damper means and said fan;

said second actuator means being operative in one condition to start said fan simultaneously with the opening of said warm air duct discharge damper means; and being operative in another condition to stop said fan simultaneously with the closing of said warm air duct discharge damper means.

10. A system for controlling the conditioning and delivery of air to a conditioned space comprising

a cool air duct for connection to a cool air supply duct;

a warm air duct for communication with a return plenum;



a delivery duct connected to both said cool air and warm air ducts for delivering air to the conditioned space;

a thermostat control device for providing a varying control signal related to the varying temperature of the air in the conditioned space;

damper means for said warm air duct for allowing air flow from the return plenum to said delivery duct and for preventing reverse flow therein;

a fan disposed in said warm air duct for effecting air flow from the return plenum to said delivery duct;

variable flow control damper means disposed in said cool air duct for varying the air flow therein between maximum flow and no flow conditions;

first actuator means responsive to said thermostat signal for controlling said variable flow control damper means;

second actuator means responsive to said thermostat signal for controlling said damper means and said fan;

said second actuator means being operative in one condition to start said fan simultaneously with the closing of said cold air duct damper means; and being operative in another condition to stop said fan simultaneously with the opening of said cold air duct damper means.

4,294,404

ENVIRONMENTAL CONTROL SYSTEM

Jagdishchandra T. Gajjar, Clifton Park, N.Y., assignor to Integrated Energy Systems, Schenectady, N.Y.

Filed Feb. 14, 1978, Ser. No. 877,682

Int. Cl.³ F24F *7/00*

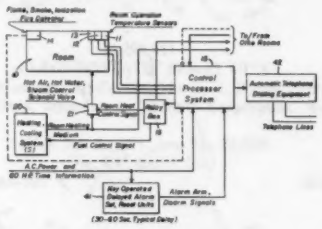
U.S. Cl. 236—49 **18 Claims**

1. An environmental control system for a structure having a plurality of rooms and means for modifying an environmental parameter within said structure comprising:

an occupancy sensor in each room of at least two rooms of said plurality of rooms providing exclusively a first output signal when said room is occupied and a second output signal when said room is unoccupied;

a second sensor in each room of at least two rooms of said plurality of rooms for providing an output signal responsive to the level of said environmental parameter in said room;

control means for receiving the output signals of each and every of said occupancy sensors and said second sensors and for controlling said means for modifying responsively to a composite function of said output signals of said occupancy sensors and said sensors; and



wherein said control means more particularly includes means for receiving the output signals of said occupancy sensors and said second sensors and for providing a control output signal, said control output signal being a composite function of said output signals of said occupancy sensor and said second sensor; and

means for receiving said control output signal and controlling said means for modifying responsively to said control output signal; and

wherein further said environmental parameter is temperature, and said means for modifying comprises an energy conversion unit and means for conveying a fluid from said energy conversion unit to said rooms.

4,294,405

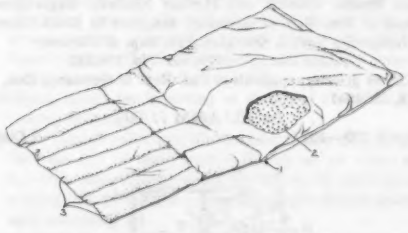
TRACTION BAG

Lawrence M. Ross, 5840 Highway V, Racine County, Caledonia, Wis. 53108

Filed Mar. 3, 1980, Ser. No. 126,335

Int. Cl.³ E01B *23/00*

U.S. Cl. 238—14 **1 Claim**



1. A reusable traction device for automobile tires comprising a bag made of flexible material, filled with fine aggregate, said filled bag being sufficiently flexible so that it will tend to conform to a tread pattern when in use, the bag having a plurality of rows of fingerlike compartments on one end, the number of compartments per row decreasing with distance from the end of the bag so that the filled bag has a wedge shaped cross section, the wedge shape of the bag tending to prevent the bag from sliding under the tire without moving the automobile.

4,294,406

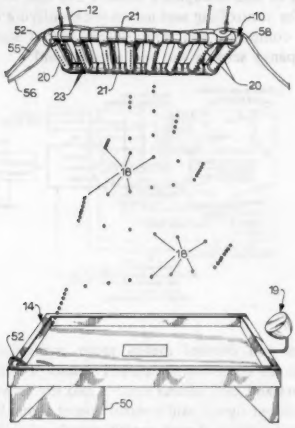
PROGRAM CONTROLLABLE FREE FALLING WATER DROP FOUNTAIN

Stephen H. Pevnick, 2314 E. Wyoming, Milwaukee, Wis. 53202

Filed Nov. 14, 1978, Ser. No. 960,621

Int. Cl.³ B05B *17/08*; F21P *7/00*

U.S. Cl. 239—20 **13 Claims**



1. A free falling water droplet fountain comprising a manifold having a series of openings, means for independently controlling the size and rate of release of water droplets from said openings, said controlling means including a plurality of valve assemblies for defining the form and size of said water droplets, said controlling means including timing means connected to said valve assemblies to selectively control the length of time of opening to form the water droplets and the time of initiation of each of the valve assemblies to release the droplets at programmed intervals whereby a constant or asymmetrical frequency can be provided for the initialization of release of water droplets from the openings and a constant or asymmetrical size of water droplet can be provided within said frequency.

4,294,407

ATOMIZER FOR FLUIDS, PREFERABLY AN INHALATION DEVICE

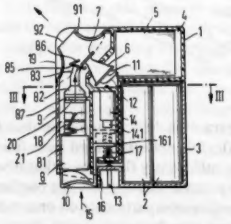
Ernst Reichl, Munich, and Herbert Marloth, Siegertsbrunn, both of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 104,581

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1978, 2854841

Int. Cl.³ A61M *11/00*

U.S. Cl. 239—102 **9 Claims**



1. Atomizer for fluid, comprising an atomizer housing, a unitary fluid container removably inserted in said housing, an atomizing element activatable by ultrasonic flexural vibrations being disposed in said housing, manually operable means integral with said fluid container for transporting the fluid from said fluid container to said atomizing element, and manually activatable means for operating said transporting means and atomizing element.

4,294,408

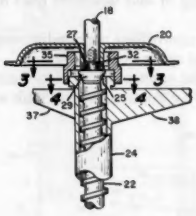
IN CENTRIFUGAL SPRAY GUNS

Irving F. Snyder, and Duane A. Luebeck, both of Blaine, Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed May 8, 1980, Ser. No. 148,135

Int. Cl.³ B05B *3/08*

U.S. Cl. 239—218.5 **11 Claims**



1. An apparatus for spraying liquid by centrifugal atomization of liquid pumped from a container to the surface of a high speed spinning disk, comprising

(a) a drive motor mounted on a vertical axis and having a downwardly projecting motor shaft;

(b) a circular disk and helical screw pump attached to said motor shaft in axial alignment, the upper end of said screw pump forming a frusto conical valve member;

(c) a hollow tube surrounding said screw pump and extending into said container, said tube having a telescoping upper portion and a lower portion which is seatable against said valve member;

(d) means for axially fixing said tube upper portion relative to said disk; and

(e) means for axially varying said disk, said tube upper portion and said valve member relative to said tube lower portion.

4,294,409

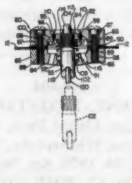
SHOWER HEAD AND VALVE ASSEMBLY FOR CAMPING SHOWER

Charles H. Larsen, 901 Date St., Rawlins, Wyo. 82301

Continuation of Ser. No. 713,714, Aug. 12, 1976, Pat. No. 4,151,616. This application Apr. 25, 1979, Ser. No. 33,035

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—577 **18 Claims**



1. In a portable shower, a shower head and valve apparatus, comprising:

a housing with an upper body portion and a lower body portion enclosing a chamber in the space between said upper and lower body portions, said upper and lower body portions each having a hole from the exterior to the

interior of said chamber, the hole in said upper body portion being axially aligned with the hole in said lower body portion, and a portion of the hole in said upper body portion having a progressively decreasing diameter defining a hole portion with upwardly converging sidewalls,

a valve stem member slidably extending through the hole in said lower body member and extending upwardly through said chamber and into said hole portion of said upper body portion, said valve stem including sealing means at its upper end, closing means normally urging said sealing means into sealing contact with said converging hole portion, and limit stop means on said valve stem operative to retain said valve in an open position and resist the urging of said closing means, and

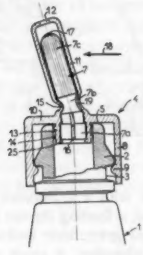
said lower body portion including ports extending from the internal surface of said lower body porton to the external surface such that when said valve stem is moved downwardly allowing water to flow into said chamber through the opening between said converging sidewalls and said sealing means, said ports conduct the water in droplet form from said chamber to the underside of said shower head and valve apparatus for release in the form of a shower.

4,294,410

CLOSING DEVICE, WITH A TILTABLE NOZZLE, FOR A PRESSURIZED CONTAINER

Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Jan. 22, 1980, Ser. No. 114,260
Claims priority, application France, Feb. 28, 1979, 79 05192
Int. Cl.³ B65D *83/14*
U.S. Cl. 239—577 **13 Claims**



1. A closing device intended to be fixed to a container neck, such closing device consisting of a dispensing cap made of an elastically deformable material; said dispensing cap comprising:

(a) a fixed part;

(b) a movable part;

(c) means on said fixed part effective to fasten said fixed part to a said container neck;

(d) deformable wall means connecting said movable part swingably to said fixed part;

(e) means on said movable part defining a discharge orifice whereby said movable part constitutes a dispensing nozzle projecting outside the container;

(f) two ends to said dispensing cap;

(g) means defining an axial channel connecting that end of the dispensing cap which is intended to face the internal volume of the container with said discharge orifice means;

(h) obturator means consisting of an elongate body of an elastically deformable material;

(i) means fixing one of the ends of said obturator body to at least one of said fixed part of the dispensing cap and said neck of the container; and

(j) means defining an externally concave intermediate zone of said obturator body between the ends thereof;

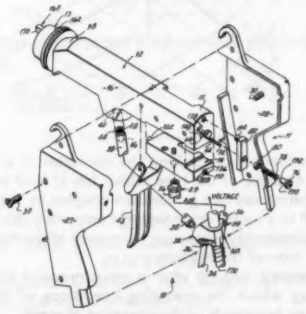
wherein said deformable wall means joining the dispensing nozzle to said fixed part of the dispensing cap surrounds said intermediate zone of the obturator means and forms a seal therewith when said dispensing nozzle is in a first position with said deformable wall means unstrained, whereby swinging of the dispensing nozzle about a transverse axis breaks said seal so that the dispensing operation can be carried out.

4,294,411

ELECTROSTATIC SPRAY GUN

Donald R. Hastings, Elyria, and Martin J. Harjar, Vermilion, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Jul. 5, 1979, Ser. No. 55,020
Int. Cl.³ B05B *5/02*
U.S. Cl. 239—707 **20 Claims**



1. An electrostatic spray gun comprising:

a substantially electrically non-conductive barrel having a fluid conduit therein adapted to be connected to a source of fluid coating material under pressure, and an air conduit,

a nozzle made from a substantially non-conductive material on the forward end of said barrel, said nozzle having a fluid discharge opening effective to project coating material therefrom, fluid valve means for controlling the flow of coating material through said discharge opening, and an air opening communicating with said air conduit for dispensing air effective to atomize said coating material issuing from said discharge opening,

charging means for imparting an electrical charge to said coating material,

a removable air valve module mounted to and externally of the rear end of said barrel including an air valve and movable valve closure means for selectively opening and closing said air valve to selectively supply said air conduit with atomizing air,

a relatively thin-walled handle shell attached to the rear end of said barrel, said handle shell surrounding said rear end of said barrel and said air valve module without said air valve module being physically supported by said handle shell permitting ready access to said air valve module by removing said handle shell, and

means for moving said movable valve closure means for selectively opening and closing said air valve and for opening said fluid valve means on opening of said air valve and closing said fluid valve means before closing of said air valve.

4,294,412
METHOD AND APPARATUS FOR CONTROLLING WOOD PULP GRINDING MACHINES

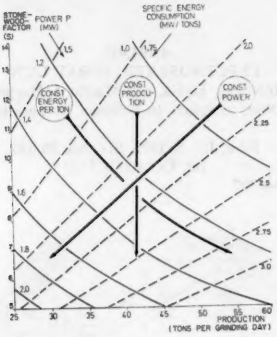
Karl G. Bohlin, Sundsvall; Borje I. Fredriksson, Matfors; Kent A. B. Karlsson, and Lars T. Nelvig, both of Sundsvall, all of Sweden, assignors to SCA Development Aktiebolag, Sweden

Continuation-in-part of Ser. No. 864,231, Dec. 27, 1977, abandoned. This application Sep. 27, 1979, Ser. No. 79,486

Claims priority, application Sweden, Dec. 27, 1976, 7614558; Dec. 27, 1976, 7614559

Int. Cl.³ B02C *25/00*

U.S. Cl. 241—30 **28 Claims**



1. A method of controlling the operation of a wood pulp grinding machine of the type which has at least two pockets per grindstone and two grindstones coupled by way of a common shaft to a single drive motor, comprising the steps of:

(i) simultaneously measuring the power of the motor and the feed rates of the pockets;

(ii) repeating step (i) after a predetermined time interval during which the operating conditions of the machine change as a result of the operation thereof;

(iii) calculating the degrees of sharpness of the grindstones using the power and feed rate values measured in steps (i) and (ii); and

(iv) dressing each grindstone when its calculated degree of sharpness reaches a determined value.

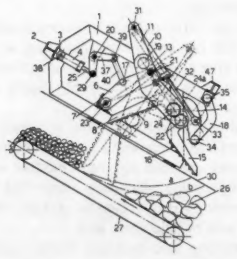
4,294,413
APPARATUS FOR THE BREAKING OF HETEROGENEOUS MATERIALS, AS CITY SOLID WASTES

Manlio Cerroni, Via Bruxelles 53, Roma, Italy

Filed Jul. 25, 1979, Ser. No. 60,322

Int. Cl.³ B02C *1/00*

U.S. Cl. 241—36 **7 Claims**



1. An apparatus for the breaking of heterogeneous materials, in particular city solid wastes in which the waste material (**26**) to the treated is conveyed by an endless belt conveyor (**27**) travelling at a constant speed, characterized by the fact that the apparatus comprises a first primary working system forming a working unit, including a rigid system of blades (**15**) and counterblades (**8**) respectively alternately juxtaposed to each other and mounted so as to rotate about a common axis and controlled in both their opening and closure directions by a guiding rod system forming an articulated quadrilateral system (**13**, **14**, **18**), pivotally connected to driving means (**10**), adapted to cause the articulated rod system to perform each operative stroke at a speed higher than that of the travel of the material (**26**) on the belt carried by the belt conveyor (**27**), while a return or closing stroke of the blades (**15**) and counterblades (**8**) is performed out of the contact of the waste material (**26**), owing to a displacement movement transmitted to the first primary system by an auxiliary system, including hydraulic driving means (**4**), further including means for performing the return stroke immediately, as the counterblades and blades (**8** and **15**) encounter a resistance higher than a predetermined value.

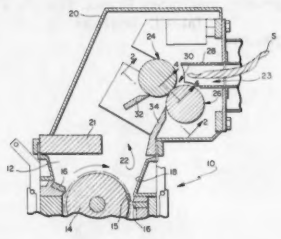
4,294,414
FEED ROLL DEVICE FOR SHEET GRANULATOR

Roy W. Gerstenberg, Norfolk, Mass., assignor to Leesona Corporation, Warwick, R.I.

Filed Jan. 14, 1980, Ser. No. 112,075

Int. Cl.³ B02C *18/22, 18/44*

U.S. Cl. 241—222 **6 Claims**

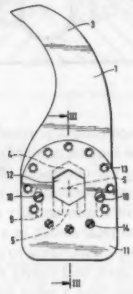


1. In combination with a granulator for size reduction of plastic sheet material, a feeding device for feeding such sheet material thereto, said granulator including walls defining a generally enclosed chamber, a rotor mounted for rotation about an axis within said chamber, cutting means affixed on said rotor, bed knife means mounted for projection into said chamber for cooperative cutting relationship with said rotor cutting means as said rotor is driven, said feeding device comprising first and second longitudinally oriented, generally cylindrical feed rolls coaxially mounted with respect to each other so as to form a longitudinally directed nip for receipt of a minimum thickness of at least a single material sheet therebetween and a maximum thickness of a plurality of said sheets, means for continuously rotating said rolls in opposite rotational directions, means for positioning said rolls in spaced relation with each other and means for directing said sheet material to said nip whereby said rolls feed said material to said chamber for granulation therein, the outer surface of both said rolls having a plurality of radial grooves inwardly extending a distance slightly greater than said maximum material thickness, said grooves longitudinally spaced from each other along each said rolls so as to form a plurality of spaced ridges adjacent said grooves, said rolls longitudinally positioned with respect to each other so that the ridges of said first roll and the grooves of said second roll and vice versa are aligned for respective interdigitation with each other such that said sheet material passing through said nip is forced into a sinuous cross-sectional configuration by said interdigitation of said rolls and whereby opposite surfaces portion of said sheet material are contacted by respective roll surfaces at different surface velocities.

4,294,415
CUTTER KNIFE

Manfred Wetter, Biedenkopf-Breidenstein, and Karl H. Schmidt, Steffenberg-Quotshausen, both of Fed. Rep. of Germany, assignors to Kraemer & Grebe GmbH & Co. KG Maschinen- und Modellfabrik, Biedenkopf-Wallau, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,038
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1978, 2836630
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—292 **12 Claims**



1. In a cutter knife having a knife blade and an opening for receiving a cutter spindle therein, which opening is constructed in the shape of a polygon and having a stop key means for said cutter spindle in a side of said opening which is opposite said knife blade, the improvement comprising at least one balancing disk having an opening therein for receiving said cutter spindle therein and being secured on said cutter knife in the region of said opening for said cutter spindle, the shape, weight and mounting of which are chosen such that the center of gravity of the totality of said cutter knife and balancing disk lies on the axis of said cutter spindle to thereby statically balance said cutter knife, said cutter knife further including dynamic balancing means for facilitating a dynamic balancing of said cutter knife.

4,294,416
CONTROLLED MULTIPACKAGE WINDING

John T. Beckman, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 19, 1980, Ser. No. 132,473
Int. Cl.³ B65H *54/08, 54/30*
U.S. Cl. 242—18 G **18 Claims**

1. A method of controlling the simultaneous winding of linear elements into more than one package, said method comprising:

(a) supplying at least two linear elements;

(b) engaging said elements in a guide means;

(c) forming said elements into at least a first and second package;

(d) sensing when said first package is a predetermined size;

(e) sensing when said second package is a predetermined size;

(f) determining when a predetermined period of time has elapsed after one of said packages has been sensed; and

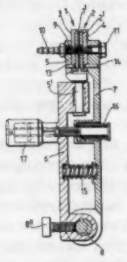
(g) increasing the distance between said packages and said guide means when either said first and second packages

have been sensed or said predetermined period of time has elapsed.

4,294,417
STATIC WIRE TENSIONER FOR COIL WINDING MACHINES

Giuseppe Camardella, Saronno, Italy, assignor to Tekma Kinomat S.p.A., Caronno Pertusella, Italy

Filed Nov. 20, 1979, Ser. No. 95,940
Claims priority, application Italy, Nov. 24, 1978, 30141 A/78
Int. Cl.³ B65H *59/22*
U.S. Cl. 242—149 **9 Claims**

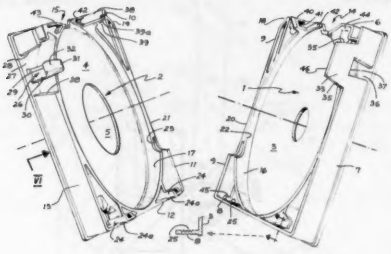


1. In a winding machine for winding coils of metallic wire for electrical or electronic use, a static wire tensioning device comprising a first friction shoe mounted fixedly on a first bearing arm, a second friction shoe, a second bearing arm, means mounting said second friction shoe on said second bearing arm for freely oscillating around an axis perpendicular to the sliding direction of the wire, means for mounting said two bearing arms rotatable one with respect to the other about an axis parallel to the sliding direction of the wire and for finely adjusting the mutual distance of said bearing arms at a distance from the friction shoe, and spring means acting on said arms for pushing said friction shoes one toward the other with finely adjusted force.

4,294,418
TAPE CARTRIDGE

Peter L. Gell, Redern, Australia, assignor to Tuscan Industries Pty. Limited, Redfern, Australia

Filed Mar. 22, 1979, Ser. No. 22,946
Claims priority, application Australia, Mar. 29, 1978, PD3805
Int. Cl.[3] G03B 1/04; G11B 15/32
U.S. Cl. 242—197 5 Claims

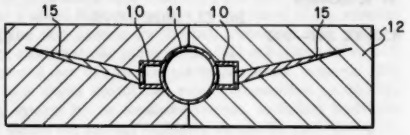


1. A cartridge to house a rotatable tape spool, said cartridge comprising a first part and a second part, each part including a rectangular panel of resilient material with upstanding flanges at the first and fourth edges of the respective panels, releasable coupling means on said first and second parts, alignment means to align corresponding flanges of the first and second parts and align said releasable coupling means to couple the first and second parts together to form a closed cartridge with an interior spool chamber to house a spool, a primary access opening comprising aligned gaps in corresponding first flanges at the first edges of the panels, a secondary access opening comprising aligned further gaps in said first flanges which further gaps provide extensions of aligned gaps in second flanges at second edges of said panels, arcuate upstanding walls on each panel to define said spool chamber and position said spool for rotation in the chamber, the upstanding arcuate walls and the flanges on the corresponding first, second, third and fourth edges of the panels substantially preventing flexure of the panel at those edges except in the panels adjacent the gaps of the primary access opening in the first flanges so as to permit flexure of the panels adjacent the gaps of the primary access opening, said releasable coupling means comprising complimentarily toothed upstanding lug means and surface means respectively at the third edges of the first and second panels which third edges lie opposite the first edges thereof, and a rigid upstanding first leg at the first edge of the panel having said lug means, the first leg at the first edge being disposed between the primary access opening and the secondary access opening in the second flange, and a rigid upstanding second leg at the fourth edge of the panel having said lug means, the second leg lying adjacent the first panel edge, shoulder means on the second leg, a rigid upstanding tongue at the fourth edge of the panel not having the lug means, the tongue engaging in a notch in the corresponding flange of the panel having the lug means so as to align the first and second parts, an aperture in the tongue engageable by the shoulder means of the second leg to releasably secure the parts together, said shoulder means being engageable in said aperture as a result of flexure of the first edges of the panels adjacent the primary access opening to convex and concave configuration to make the second leg lie inwardly of the flange of the fourth edge of the panel having the lugs and to make the tongue lie outwardly of the second leg, and an opening in one panel to permit driving engagement of driving means with a spool when housed in said chamber.

4,294,419
AIRFRAME ASSEMBLY AND PROCESS

Jack A. Fouse, Dallas, and Sherwood W. McClaren, III, Grand Prairie, both of Tex., assignors to Vought Corporation, Dallas, Tex.

Filed Jan. 22, 1979, Ser. No. 4,965
Int. Cl.[3] B64C 1/00; B23K 20/22
U.S. Cl. 244—117 R 9 Claims



1. The method of assembling a portion of an airframe having a minimum radar cross section comprising the steps of:

(a) diffusion bonding the periphery of a preform capable of being superplastically formed and diffusion bonded onto the outer surface of a substantially cylindrical casing,

(b) placing said cylindrical casing in a mold having a cavity therein substantially conforming to the external dimension of a structural air duct, said cavity enclosing said preform and said mold supporting a wing structure with the wing root face forming a portion of said cavity, and

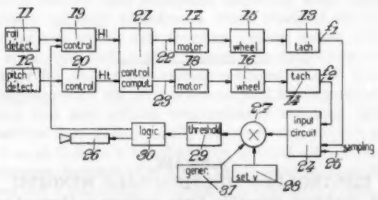
(c) heating said preform to a superplastic forming and diffusion bonding temperature and applying sufficient pressure across said preform to superplastically deform said preform to conform to the dimensions of said mold and diffusion bond said deformed preform to said wing root face.

6. The product made by the method of claim 1.

4,294,420
ATTITUDE CONTROL SYSTEMS FOR SPACE VEHICLES

Jean B. Broquet, Saint Cyr l'Ecole, France, assignor to Matra, Paris, France

Filed Jan. 30, 1978, Ser. No. 873,684
Int. Cl.[3] B64G 1/20
U.S. Cl. 244—165 14 Claims



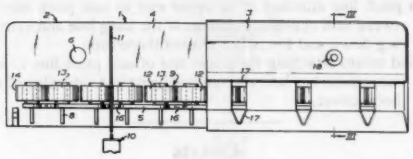
1. An attitude control system for a body-stabilized space vehicle designed for travelling in an orbit and having roll, pitch and yaw axes, comprising: a plurality of sensors carried by the vehicle for sensing angular deviations about at least two of said axes, an actuator including only two wheels rotatable about respective non-aligned spin axes fixed with respect to said vehicle, electronic control means connected to receive input signals from the sensors and to control the rotation speeds of said two wheels for attitude correction about two orthogonal axes of said vehicle, said actuator permanently having, in operation, a momentum providing a gyroscopic stiffness providing short term stabilization about a third axis orthogonal to said two orthogonal axes, wherein each wheel is operatively associated with a tachometer generator and the electronic control means has means each associated with one of said tachometer generators to compute the angular position

of the momentum of the actuator relative to said axes of the vehicle.

4,294,421
KNIFE HOLDER

Erich Künstlicher, Johan Baners Gata 6, 252 33 Helsingborg, and Harry V. Thomasson, Box 29, 260 33 Paarp, both of Sweden

PCT No. PCT/SE78/00093, § 371 Date Aug. 7, 1979, § 102(e) Date Aug. 7, 1979, PCT Pub. No. WO79/00376, PCT Pub. Date Jun. 28, 1979
PCT Filed Dec. 11, 1978, Ser. No. 140,387
Claims priority, application Sweden, Dec. 12, 1977, 7714058
Int. Cl.³ A47G *21/14;* A47F *7/00*
U.S. Cl. 248—37.6 **11 Claims**

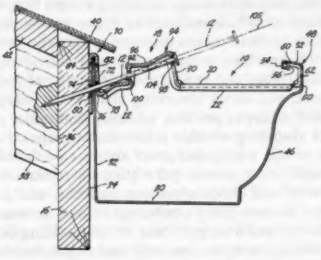


1. A holder for knives and similar flatware, the holder having an elongate base which may be mounted on a surface for example a wall or the like and supports one or more gripping members with which the knives may individually be moved with their blades into and out of retentive engagement, characterized in that each gripping member comprises two rollers in side by side relationship and cooperating with each other, the rollers being at least partially made of an elastomer material and each being mounted on a journal located on the base, the rollers having facing circumferential surfaces which form a nip into and out of which the knife blade may be moved, with the rollers rolling on the two sides of the blade under elastic blade-retentive deformation of the rollers.

4,294,422
GUTTER HANGER

William H. Odekirk, 7446 Gatewood Rd., SW., Seattle, Wash. 98136

Filed Sep. 24, 1979, Ser. No. 78,295
Int. Cl.³ E04D *13/06*
U.S. Cl. 248—48.2 **8 Claims**



1. A hanger for mounting a gutter to a structure with a fastener, comprising:

a hanger member extending across the width of said gutter comprising a substantially horizontally disposed bracket arm and a raised fastener guide portion;

first means attached to one end of said bracket arm for engaging the outside wall of said gutter; and

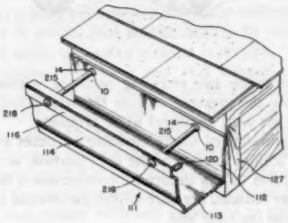
second means attached to one end of said fastener guide portion for engaging the inside wall of said gutter and for receiving said fastener to mount said gutter to said structure;

said raised fastener guide portion comprising a first upright section extending upwardly from said bracket arm, a second upright section extending upwardly from said hanger member, a connecting crosspiece between said first upright section and said second connecting crosspiece including a downwardly bent mid-section for engaging and retaining a fastener extending through said fastener guide portion, said upright sections having apertures formed therein for receiving said fastener.

4,294,423
SEALING MEANS FOR GUTTER HANGER FASTENING MEANS

Lacy A. Rowe, 1851 Skycoe Dr., Salem, Va. 24153

Filed Mar. 10, 1980, Ser. No. 128,727
Int. Cl.³ E04D *13/06*
U.S. Cl. 248—48.2 **3 Claims**



1. Gutter wall fasterner nail hole sealing means for use with a rain gutter having a rear wail portion adapted to be secured to a facia board or wall of a building, fastening means for securing the gutter to the building wall, including a headed nail or like headed and sharpened fastening means adapted to be driven through a hole in the rear wall of the gutter and into the facia board; said sealing means comprising compressible elastomeric material adapted to be compressed about the rear gutter wall nail hole, when the nail is driven through the rear gutter wall into the facia board whereby the facia board is protected against deterioration due to leakage of water about the rear gutter wall nail hole, said gutter including a front wall spaced from the rear gutter wall, said front and rear walls having apertures through which said sharpened fastening means is adapted to be driven to secure the gutter to a facia board; a fastener receiving tube or ferrule interposed between the apertures in said front and rear walls of the gutter, said sealing means comprising a compressible grommet of elastomeric material having a body portion adapted to fit within one end of said fastener receiving tube or ferrule, said grommet body portion having a passage there through coaxial with the outer tube or ferrule when the body of the grommet is inserted therein, through which passage in the body of the grommet said sharpened fastening means is adapted to be driven, compressible means at one end of the grommet projecting beyond the ferrule and extending between the end of the ferrule and the gutter rear wall, said compressible means being adapted to be compressed when the fastener is driven into the facia board.

4,294,424
SUCTION GRIPPING DEVICE

Jacques Teissier, 18, rue Gustave Flaubert, Rueil-Malmaison, France (92500)

Filed Jul. 16, 1979, Ser. No. 57,634
Claims priority, application France, Jul. 20, 1978, 78 21554
Int. Cl.³ A45D *42/14;* F16B *47/00*
U.S. Cl. 248—362 **6 Claims**

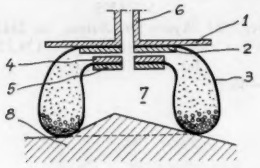
1. A gripping device adapted when under reduced pressure

to be brought into close gripping conformity with the surface of an object to be gripped, comprising,

(a) a ring-shaped body deformable in any direction and having a head portion and a skirt portion, the skirt portion having walls of deformable material defining a hollow interior within the skirt, and defining an open space outside the skirt and within the ring;

(b) at least one means in the head portion communicating the hollow interior of the skirt with means for withdrawing fluid from the interior and reducing pressure within the interior to below the pressure outside the skirt;

(c) at least one means in the head portion communicating the open space with means for withdrawing fluid from the



open space and reducing pressure within the space to below the pressure outside the ring when the skirt is in contact with an object to be gripped;

(d) a plurality of freely movable particles confined within the hollow interior of the skirt portion, and compelled to conform to any deformed configuration thereof adopted under reduced pressure within the interior of the skirt, and within the ring; and

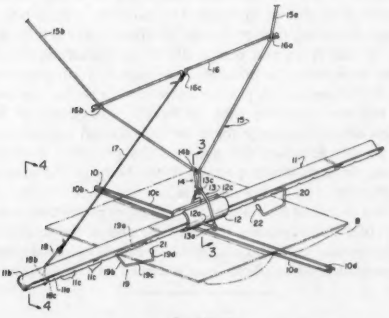
(e) the body walls of the skirt portion under such reduced pressure and higher external pressure conforming closely to the surface of an object to be gripped, and retaining and fixing the particles in such conformity, thereby firmly gripping the object while such reduced pressure continues.

4,294,425

OVERHEAD BOOKHOLDER

Paul J. Weber, 22 Seneca Rd., Fort Lauderdale, Fla. 33308

Filed Oct. 9, 1979, Ser. No. 82,862
Int. Cl.[3] A47B *23/00*
U.S. Cl. 248—445 **13 Claims**



1. In an apparatus for holding a book open above a reader, said apparatus comprising:

a suspension bar shaped and dimensioned to extend laterally across the cover of an open book and beyond the opposite side edges of said cover;

means for attaching said suspension bar to an open book to position the suspension bar extending across the cover of the book transverse to the spine of the book and projecting laterally past the opposite side edges of the book cover;

manually yieldable page retainer means operatively coupled to said suspension bar for engagement with the open pages of the book from below to hold the book open;

and suspension means operatively coupled to said suspension bar to suspend it from above;

the improvement wherein said suspension means comprises:

a flexible hang line having interconnected opposite segments attachable respectively at spaced points to an overhead support to position the middle of the hang line closely above said suspension bar;

means for operatively connecting said suspension bar to the middle of the hang line to be suspended from the latter;

a pitch bar extending transversely between and operatively connected to said opposite segments of the hang line above said last-mentioned means;

a pitch line attached at its upper end to said pitch bar between said opposite segments of the hang line and extending down and laterally outward therefrom;

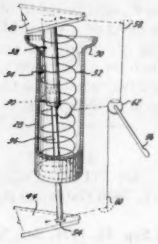
and means attaching the lower end of said pitch line to said suspension bar laterally outward past one side edge of the book cover.

4,294,426

UNIQUE JOINT ESPECIALLY USEFUL WITH JUVENILE FURNITURE AND PLAYTHINGS

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 758,799, Jan. 12, 1977, Pat. No. 4,160,553.
This application Apr. 2, 1979, Ser. No. 26,419
Int. Cl.[3] F16M *13/00*
U.S. Cl. 248—561 **15 Claims**



1. A joint adapted to be used in a child holding, carrying and amusement system, said joint comprising, in combination, an outer sleeve, said outer sleeve including at least two sections an upper section of which includes an upper end having a flared end portion, resilient means disposed within the outer sleeve, and a shock absorbing member employed in conjunction with the resilient means and spaced from the internal walls of said outer sleeve, said shock absorbing member including a lower portion and an upper portion, whereby said upper portion of said shock absorbing member is free to move up and down and from side to side within said outer sleeve, said flared end portion of said outer sleeve permitting increased side-to-side movement of said shock absorbing member, said joint being adapted to be removably connected to and between a child holding device and a support base for said holding device, said resilient means in conjunction with said shock absorbing member providing up and down motion and side-to-side motion with respect to said outer sleeve, further including connecting means for connecting said joint to a child holding device and a support base therefor, said connecting means comprising upper connecting means connected to said upper portion of said resilient means and shock absorbing member for connecting said shock absorbing member to a child holding device, and further including control means for controlling and locking said joint to limit movement, said control means comprising a lift member disposed between the two sections of said outer

sleeve and pivotally connected to said sections, said lift member including handle means disposed externally to said outer sleeve and extending through a slot in one of said sections of said outer sleeve, whereby downwardly applied force on said handle means causes said lift member to separate said two sections of said outer sleeve.

4,294,427

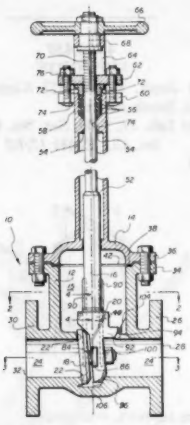
MONO-SEAT GATE VALVE

Eugene J. Cilny, 13418 Lindsay, Cypress, Tex. 77429

Filed Jul. 19, 1979, Ser. No. 59,251

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—86 **3 Claims**



1. A gate valve comprising:

(a) a valve body formed to define inlet and outlet passages having a common axis, said valve body further defining a transverse axis being substantially normal to said common axis, said valve body defining an annular seat about at least one of said inlet and outlet passages, said seat lying in a plane that is inclined at a first angle with respect to said transverse axis, said seat being formed to define a frusto conical annular sealing surface, said sealing surface being generated about an axis disposed in normal relation to said inclined plane, said body defining first and second cam action surfaces inclined at a second angle with respect to said transverse axis in a direction opposite that of the plane of said valve seat, said cam action surfaces being positioned outside of the flow passage defined by said inlet and outlet passages and respectively above and below said flow passage, and a second body section defining a valve chamber communicating with said inlet and outlet passages;

(b) a bonnet cooperating with said second body section to further define said valve chamber;

(c) a closure member, comprising;

(1) a hanger forming a front surface defining a plane, said plane inclined at said first angle with respect to a central axis of said hanger, and having a mounting hole therethough normal to said front surface plane, and having a vertically oriented arcuate member positioned on each side of said mounting hole adjacent thereto, said hanger further defining first and second cam action surfaces for engaging respective body first and second cam action surfaces, each of said hanger cam action surfaces inclined at said second angle with respect to said central axis;

(2) a valve disc defining a plane and having a mounting shaft formed at the geometric center thereof normal to said valve disc plane, said valve disc being carried and retained solely by said hanger in a spaced relation to said valve body in a manner to permit limited universal movement of said disc with respect to said hanger about an axis passing through said mounting hole normal to said hanger front surface plane, and positioned so that said disc plane is essentially parallel to said valve seat plane, said valve disc permitted to pivot about said mounting hole axis sufficiently to engage said valve seat and effect a uniform seal therebetween to preclude fluid flow through said passage; and

(3) a valve stem having an axis coincident with said valve body transverse axis, said stem extending through said bonnet and valve chamber and carrying said hanger by a means permitting limited movement of said hanger with respect to said stem in a plane normal to said stem axis, said stem threadedly engaging said bonnet for raising and lowering said hanger and said valve disc with respect to said body flow passage;

(d) an annular seal positioned within said bonnet and about said stem for precluding the escape of medium fluid therebetween; and

(e) a back seal formed by said stem and said bonnet when said stem is in its uppermost position for sealing said valve chamber to permit said annular seal to be removed and replaced while said valve remains in service,

whereby lowering said stem and said hanger causes said hanger respective first and second cam action surfaces to engage respective first and second valve body cam action surfaces, thereby causing an axial force along said valve stem to be transmitted through said vertically oriented arcuate members to the geometric center of said valve disc in a direction essentially normal to said valve seat plane for urging said valve disc into sealing engagement with said valve seat to preclude fluid flow through said body flow passage.

4,294,428

BUTTERFLY VALVE

Yoshitsugu Okada, and Osamu Nakai, both of Hirakata, Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 892,342, Mar. 31, 1978, abandoned.

This application Dec. 3, 1980, Ser. No. 212,465

Claims priority, application Japan, Apr. 1, 1977, 52-37985; Apr. 1, 1977, 52-41104; Apr. 6, 1977, 52-40205

Int. Cl.³ F16K *31/44, 1/22, 41/02*

U.S. Cl. 251—214 **7 Claims**

1. A butterfly valve comprising a valve housing having spaced bearing portions,

a valve stem rotatably supported by said bearing portions said valve stem being axially adjustable in said bearing portions,

a tubular bearing member disposed between at least one of said bearing portions and said valve stem,

a valve body mounted on said valve stem,

a tubular holder member including an elastic seal member having respective upper and lower ring portions retainable in respective annular recesses of the tubular holder member, said elastic seal member including at least one web portion interconnecting said upper and lower ring portions,

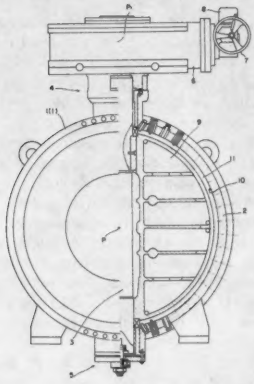
said upper ring portion contacting the bearing portion and said lower ring portion contacting said valve body, said tubular holder member further contacting one of a plurality of valve seat portions of said valve body,

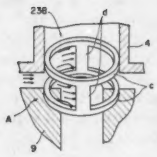
said plurality of valve seat portions attached to said valve housing to contact a periphery of said valve body in a closed position,

said elastic seal member fitted exteriorly on said tubular holder member contacting said bearing portions and being rotatable relative to said valve stem,

said elastic seal member upper and lower ring portions being

responsive to line fluid pressure for pressing the elastic seal member upper and lower ring portions against a side





wall of said annular recesses when in a closed valve position.

4,294,429

PULLEY ASSEMBLY FOR IMPROVING THE COOPERATION BETWEEN A WINCH AND A CABLE ACTUATED THEREBY

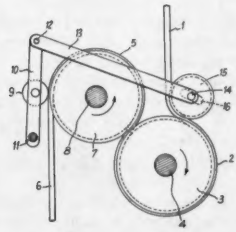
André Desplats, Boulogne Billancourt, France, assignor to Tractel S.A., France

Filed Aug. 13, 1979, Ser. No. 66,276

Claims priority, application France, Aug. 22, 1978, 78 24359

Int. Cl.³ B66D *1/74*

U.S. Cl. 254—272 **4 Claims**



1. A cable hoist apparatus comprising:

(i) a first pulley for driving in rotation in one direction, said pulley having a peripheral groove of which the cross-sectional shape is without cable-wedging action,

(ii) a second pulley for driving in rotation at the same velocity in the other direction, said second pulley having a peripheral groove of which the cross-sectional shape provides cable-wedging action.

(iii) a presser means movable in the same plane towards and away from the peripheral groove of said second pulley,

(iv) a third pulley having its axis of rotation movable in a common plane of rotation of the three pulleys, said third pulley being coupled to said presser means, and

(v) a cable which, starting from a load-bearing portion thereof, is passed in said other direction about said third pulley and then in said one direction about said first pulley and then in said other direction about said second pulley, between said second pulley and said presser means,

whereby force is exerted by said presser means to urge said cable into the peripheral groove of said second pulley in proportion to tension in the load-bearing portion of the cable tending to move the axis of the third pulley in said common plane.

4,294,430

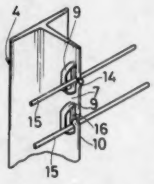
SUPPORTS

Christiaan L. de Jager, Flat 1, 322 Kingsway, Amanzimtoti, Natal Province, South Africa

Filed Feb. 27, 1980, Ser. No. 125,403

Int. Cl.³ E04H *17/02*

U.S. Cl. 256—58 **3 Claims**



1. A fence wire support, comprising:

(a) an elongated, substantially planar strap (7) of malleable metal,

(b) a plurality of closed, elongated slots (6) defined in the strap at spaced locations along its length,

(c) each slot lying just inwardly of one edge of the strap and oriented substantially parallel thereto to define an integral continuous strip (10) of the support between an outer side (8) of the slot and said one edge of the strap, said strip being frangible and deformable by manually operable tools pursuant to the installation of a fence wire in the slot; and a web of metal (9,11) displaced during the formation of each slot spanning and connected between the opposite ends thereof, each web (11) being bent away from said one edge of the strap to leave its associated slot substantially laterally unobstructed.

4,294,431

METHOD OF PROVIDING AND MAINTAINING A WEAR-LINING OF A STEEL CONVERTER AND A STEEL CONVERTER HAVING SUCH A LINING

Adam Steen, Heemskerk, and Hendrik M. Verhoog, Heemstede, both of Netherlands, assignors to Hoogovens Ijmuiden B.V., Ijmuiden, Netherlands

Filed Jul. 6, 1979, Ser. No. 55,388

Claims priority, application Netherlands, Jul. 14, 1978, 7807580

Int. Cl.³ C21B *13/00, 15/00*

U.S. Cl. 266—44 **9 Claims**

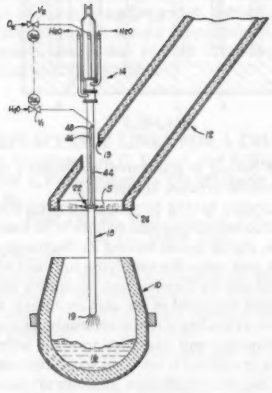
1. In a method of operating a steel converter which has a basic wear-lining formed of refractory material at least partly composed of burnt magnesite, including the step of performing maintenance on the said lining by intermittently spraying refractory material onto the wear-lining and/or slagging-in while the wear-lining is hot, the improvement that the particles of the magnesite component of the wear-lining contain on average more than 6% monticellite.

4,294,432

METHOD AND APPARATUS FOR COOLING BOF HOOD PANELING

Matthew J. Blair, Niles, and Thomas A. Wiktorowski, Parma Heights, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jun. 2, 1980, Ser. No. 155,311
Int. Cl.[3] C21B 7/10
U.S. Cl. 266—46 11 Claims



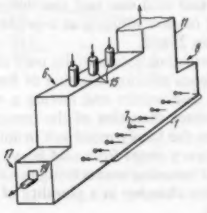
1. In a method of making steel in a basic oxygen furnace having an oxygen lance and an exhaust hood over the furnace, the steps comprising: providing a plurality of fluid outlet spray nozzles about the oxygen lance at a location adjacent the bottom edge of the exhaust hood when the lance is in an operative position in the furnace, supplying water under pressure to the nozzles, and directing the water outwardly from the lance toward the hood, with spray streams from adjacent nozzles intersecting between the lance and the hood.

4,294,433

PYROMETALLURGICAL METHOD AND FURNACE FOR PROCESSING HEAVY NONFERROUS METAL RAW MATERIALS

Andrei V. Vanjukov, ulitsa Miklukho-Maklaya, 65, kv. 4, Moscow; Valery V. Mechev, prospekt Lenina, 44a, kv. 49, Norilsk; Valentin P. Bystrov, Schelkovsky proezd, 3, korpus 3, kv. 43, Moscow; Evgeny I. Ezhov, Grazhdansky prospekt, 11, Leningrad; Mikhail G. Vasiliev, prospekt Lenina, 31, kv. 89, Norilsk; Vladimir Y. Zaitsev, ulitsa Lobachevskogo, 6, kv. 34; Vladimir A. Romenets, Lomonosovsky prospekt, 33, korpus 2, kv. 87, both of Moscow; Vladimir V. Ivanov, ulitsa Leningradskaya, 22, kv. 26; Sergei Y. Golik, prospekt Lenina, 13, kv. 87, both of Norilsk; Evgeny S. Grin-Gnatovsky, 2 Schukinsky proezd, 5, kv. 1, Moscow; Alexandr V. Grechko, Vesennaya ulitsa, 4, kv. 42; Ivan V. Savin, ulitsa Vesennaya, 4, kv. 56, both of Ryazan; Sultanbek M. Kozhakhmetov, ulitsa Shevchenko, 32, kv. 16; Veniamin B. Meierovich, ulitsa Auezova, 175b, kv. 29, both of Alma-Ata; Vladimir D. Nagibin, ulitsa Pushkinskaya, 7/5, kv. 6, Moscow; Nariman A. Ramazanov, ulitsa Seifullina, 452/3, kv. 25; Almas B. Umarov, Mikroraion Koktem - 1, dom 37, kv. 51, both of Alma-Ata; Valentin E. Ziberov, ulitsa Voronezhskaya, 38/43, kv. 309, Moscow; Askar M. Kunaev, ulitsa Vinogradova, 49/130, kv. 23; Sauk T. Takezhanov, ulitsa Shevchenko, 44, kv. 3, both of Alma-Ata; Petr A. Alexandrov, ulitsa, Pushkinskaya, 2, Balkhash Dzhezkazganskoi oblasti; Boris I. Kolesnikov, prospekt Lenina, 11, kv. 24, and Dzhonson T. Khagazheev, ulitsa Entuziastov, 53, kv. 93, both of Norilsk, all of U.S.S.R.

Division of Ser. No. 962,603, Nov. 21, 1978, Pat. No. 4,252,560.
This application Jul. 30, 1980, Ser. No. 173,807
Int. Cl.[3] F27B 1/20
U.S. Cl. 266—161 13 Claims



1. A furnace for carrying out the pyrometallurgical method for processing heavy nonferrous metal raw materials comprising:

a shaft, where a charge is fed into a prepared heterogeneous melt composed of slag and matte, charge components being caused to interact with said melt and an oxygen-bearing gas to yield smelting products, said shaft having:

having a jacket section in the middle part of said shaft;

cooled side tuyeres intended to supply said oxygen-bearing gas into said molten bath and placed at a level dividing said shaft into two vertical parts, or a top and a bottom parts, the ratio of the height of said top part to that of said bottom part ranging from about 2-to-1 to about 10-to-1;

a hole for feeding said charge and/or said fuel provided in said top part of the shaft;

a flue for exhausting said gaseous smelting products placed in said top part of said shaft;

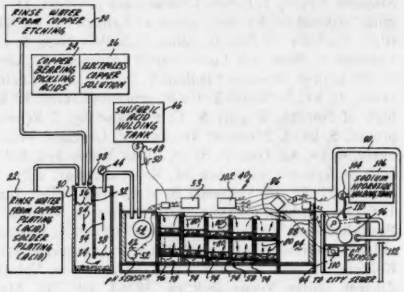
ducts intended for discharging said slag, said matte and/or said crude metal and arranged in said bottom part of the shaft; and

a device for discharging said slag from said bottom part of said shaft formed with a separate recipient adjoining said shaft and communicating therewith by means of a duct placed below the level of said tuyeres, but above the level of the matte inside said shaft with the effect that the level of the slag in said recipient determines that of the melt inside said shaft.

4,294,434
HEAVY METAL REMOVAL APPARATUS

Richard G. Durkee, 3616 W. Pendleton, Santa Ana, Calif. 92704

Filed Jan. 24, 1980, Ser. No. 115,039
Int. Cl.[3] C22B *15/12*
U.S. Cl. 266—170 15 Claims


RINSE WATER FROM COPPER ETCHING
COPPER REMOVAL PICKLING ACIDS
ELECTROLESS COPPER SOLUTION
SULFURIC ACID HOLDING TANK
RINSE WATER FROM CONTROL PLATING (ACID)
CAUSTIC PLATING (ALK.)
SODIUM HYDROXIDE HOLDING TANK

1. An apparatus for reclaiming heavy metal from heavy metal salts in an aqueous solution, comprising:

a. A reaction chamber defining a path for receiving and for conducting said solution therethrough;

b. A source of concentrated acid sufficient to impart a pH less than 2 to said aqueous solution wherein said acid in solution has anions;

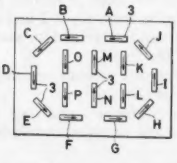
c. First valve means connecting said concentrated acid to said reaction chamber, said valve means operable in response to the pH of said aqueous solution for admitting amounts of said acid into said reaction chamber to maintain the pH of said solution at a predetermined level at least less than 2; and

d. Means for retaining, substantially pure aluminum stable in an acid aqueous solution, capable of forming a salt compound with said anions and having a relative electrode potential greater than that of the heavy metal to be reclaimed from the heavy metal salt in solution for precipitating said heavy metal from said heavy metal salt in said solution, said retaining means being positioned in said path in the reaction chamber at a plurality of points along said defined path.

4,294,435
METHOD FOR AGITATION OF MOLTEN METAL AND FURNACE FOR AGITATION OF MOLTEN METAL

Ryohei Matsuno, Tokyo, Japan, assignor to Daido Giken Industries, Co., Ltd. and Amino Aluminium Industries, Co., Ltd., both of Tokyo, Japan

Filed Dec. 19, 1978, Ser. No. 971,044
Claims priority, application Japan, Dec. 26, 1977, 52-155651
Int. Cl.[3] H05B *5/12*
U.S. Cl. 266—234 1 Claim

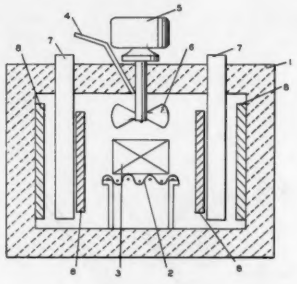


1. An agitation melting furnace for molten metal, which comprises a furnace proper made of a refractory material and two sets of electromagnetic-wave devices each formed of a coil and an iron core, one set of electromagnetic-wave devices being disposed to define magnetic fields forming a circle on the outer surface of the bottom of said furnace, the magnetic fields of said one set of electromagnetic-wave devices being all in one same direction, the other set of electromagnetic-wave devices being disposed within said circle in at least one row, the magnetic fields of said other set of electromagnetic-wave devices in at least one row being all in one same direction.

4,294,436
FURNACE WITH PROTECTIVE ATMOSPHERE FOR HEATING METALS

Susumu Takahashi, Yokohama, Japan, assignor to Kanto Yakin Kogyo Kabushiki Kaisha, Japan

Filed Aug. 29, 1980, Ser. No. 182,774
Claims priority, application Japan, Sep. 5, 1979, 54-112996
Int. Cl.[3] C21D *1/06*
U.S. Cl. 266—257 3 Claims



1. A furnace having a protective atmosphere therein for heat-treating metallic articles, comprising

a heating enclosure having between the sidewalls thereof a space for accommodating said articles to be treated within the furnace, piping means having its discharge communicating with said space for supplying into said enclosure a raw material gas for forming said protective atmosphere,

heating elements provided in the said enclosure, and

catalytic means extending into the enclosure adjacent to said heating means and and operative to react with said raw material gas to convert it into said protective atmosphere,

said catalytic means comprising a plurality of spaced, metallic, catalytic elements secured in said enclosure adjacent opposite sides thereof, and with at least certain of said catalyst elements being disposed in spaced relation to said sidewalls of said enclosure.

4,294,437
SLIDE CLOSURE FOR THE POURING NOZZLE OF A MOLTEN METAL VESSEL

Hajimu Sawada, Kawasaki, and Hisao Inubushi, Yokohama, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo; Nippon Rotary Nozzle Co., Ltd., Kawasaki; Kokan Kikai Kogyo Kabushiki Kaisha and Tokyo Yogyo Kabushiki Kaisha, both of Tokyo, all of, Japan

Filed Oct. 11, 1979, Ser. No. 83,970
Claims priority, application Japan, Oct. 12, 1978, 53-124654
Int. Cl.[3] C21C *5/48*
U.S. Cl. 266—272 2 Claims

1. In a slide closure for a molten metal vessel having a pouring nozzle comprising:

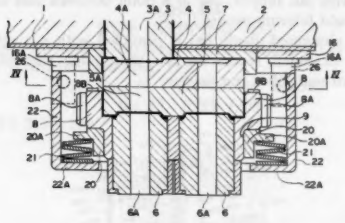
a fixed plate brick attached to a bottom portion of said vessel and having at least one pouring opening;

a sliding plate brick having at least one opening and rotatably pressed against a lower surface of said fixed plate brick whereby rotation of said sliding plate brick brings said opening into or out of alignment with said pouring opening to open or close said pouring nozzle;

a rotor for receiving said sliding plate brick so as to be rotated therewith by a driving source; and

supporting means for slidably supporting said rotor and for urging said rotor in a direction to press said sliding plate brick against said fixed plate brick with a bed plate of said vessel serving as a fulcrum;

a slide closure for a molten metal vessel having a pouring nozzle characterized in that said supporting means com-



prises a first supporter arranged to surround and slidably support said rotor and including an outwardly projected annular portion, and a second supporter fastened to said vessel bed plate with pins so as to urge said first supporter upwardly or in a direction to press said sliding plate brick against said fixed plate brick with dish spring means being placed between said second supporter and a lower side of the annular projection of said first supporter so as to surround said first supporter.

4,294,438

REPLACEABLE LINER FOR A CRUCIBLE

William A. Nystrom; Leo C. Lanzel, and William A. Bauer, all of St. Marys, Pa., assignors to The Stackpole Corporation, St. Marys, Pa.

Filed Jul. 30, 1980, Ser. No. 173,735
Int. Cl.³ B28B *7/08*
U.S. Cl. 266—280 **6 Claims**

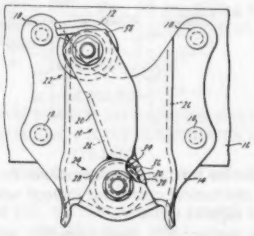
1. A replaceable liner for a crucible for molten metal, the liner consisting of an open-top receptacle having at least its side wall made of graphite foil preformed from compressed expanded graphite.

4,294,439

SPRING SHACKLE

Lester A. McIntosh, deceased, late of Grosse Pointe Shores, Mich. (by Detroit Bank & Trust Co., executor), assignor to McIntosh Corporation, Detroit, Mich.

Filed Apr. 9, 1979, Ser. No. 28,561
Int. Cl.³ F16F *1/26*
U.S. Cl. 267—54 A **10 Claims**



1. A spring shackle for mounting one end of a suspension spring to a vehicle frame, comprising:

a body member;

first mounting means integral with one end of said body member for connecting said shackle to one of said frame or spring;

second mounting means integral with the opposite end portion of said body member for connecting said shackle to the other of said frame or spring, said second mounting means comprising an integral extension of said body member curving in helical-like fashion and defining a generally cylindrical bore,

said integral extension having an offset portion defining a recess disposed radially outwardly from said bore and a free end portion, said recess terminating axially at points spaced axially inwardly from the ends of said bore, said integral extension tapering to a reduced circumferential thickness at said free end portion thereof, said free end portion being nestingly disposed in said recess whereby the internal wall of said bore is substantially continuous; and

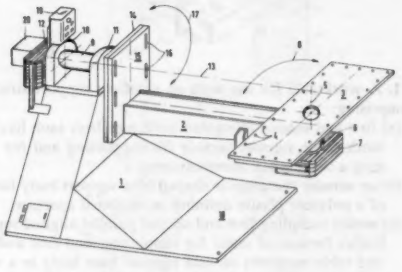
an elastomeric bushing press fit into and directly frictionally engaging said bore.

4,294,440

HOLDING DEVICE

Wilhelm Severt, Venn Diek 21, 4426 Vreden, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,445
Int. Cl.³ B23Q *1/04*
U.S. Cl. 269—71 **3 Claims**



1. A holding device for enabling heavy workpieces of the order of several tons to be oriented without reclamping into any position so that welding seams in the workpiece may be favorably welded horizontally from above, comprising a frame, a first rotary support means mounted on said frame for rotation about a fixed horizontal axis, said first rotary support means comprising a first vertically disposed flange which is rotated about said fixed horizontal axis, a second vertically disposed flange mounted face-to-face on said first flange, mounting means on said first and second flanges for adjusting their relative mounting positions such that said second flange is displaceable relative to said first flange in a direction perpendicular to said fixed horizontal axis such that said second flange is mountable on said first flange at different positions relative to said first flange, a third rotary support means having an axis of rotation coincident with said fixed horizontal axis of said first rotary support means, said third rotary support means comprising a third vertically disposed flange rotatable about said fixed horizontal axis, a fourth vertically disposed flange mounted face-to-face on said third flange, additional mounting means for adjusting their relative mounting positions such that said fourth flange is displaceable relative to said third flange in a direction perpendicular to said fixed horizontal axis such that said fourth flange is mountable on said third flange at different positions relative to said third flange and in a direction perpendicular to said fixed horizontal axis, a support arm having one end mounted on said second vertical flange and extending generally horizontally from said second vertical flange, said

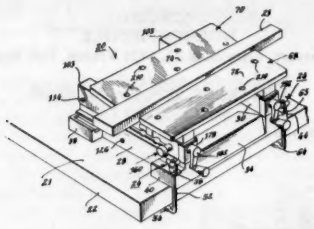
support arm having its other end mounted on said fourth flange, and a second rotary support means mounted on said support arm, said second rotary support means comprising a clamping plate on which said workpiece is clamped and a drive means for rotating said clamping plate about a rotary axis which is perpendicular to said fixed horizontal axis, whereby said clamping plate has unlimited rotational mobility and hence also the workpiece clamped thereto so that each welding seam on the workpiece may be disposed in a horizontal position and the seams in the workpiece may be favorably welded from above while such seams are horizontally disposed.

4,294,441

APPARATUS FOR SUPPORTING A WORK PIECE

Michael L. O'Banion, 15 Poppy La., East Lyne, Conn. 06333, and Jack R. Veara, 5408 Emerald Dr., Eldersburg, Md. 21784

Filed May 15, 1979, Ser. No. 39,244
Int. Cl.³ B23Q *3/02*
U.S. Cl. 269—97 **26 Claims**



1. A worktable for use with an auxiliary support structure comprising:
(a) first and second elongated table members each having a work piece support surface for supporting and for gripping a work piece therebetween;
(b) an annular rectangular shaped base support body formed of a polymer plastic defining an enclosed aperture;
(c) means including first and second parallel aligned support bodies formed of metal for supporting said first and second table members on said support base body in a work plane parallel to and juxtaposed with said support base body;
(d) means including first and second screws supported by said first and second parallel aligned support bodies for varying the relative position between the first and second table members in said work plane to provide a spacing therebetween for receiving and gripping work pieces of different sizes between said table members;
(e) said support base body positioned relative to said table members for enabling a gripped work piece to extend through said aperture and to contact a surface of the auxiliary support structure; and,
(f) adjustable, demountable means for clamping said support base body to an auxiliary support structure at a plurality of different locations on said auxiliary support structure.

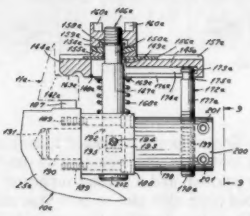
4,294,442

WORKPIECE PALLET WITH DISTORTION FREE CLAMPING MEANS

Kenneth O. Kolnes, and Wynsel J. Johnson, both of Rockford, Ill., assignors to Greenlee Bros. & Co., Rockford, Ill.

Division of Ser. No. 934,751, Aug. 21, 1978, abandoned, which is a division of Ser. No. 832,764, Sep. 12, 1977, Pat. No. 4,148,470, which is a division of Ser. No. 652,257, Jan. 26, 1976, abandoned. This application Jan. 18, 1980, Ser. No. 113,012
Int. Cl.³ B25B *1/04*
U.S. Cl. 269—101 **2 Claims**

1. In a clamping means for clamping workpieces on a pallet for use in a transfer machine, the combination comprising:
(a) an elongated support bar;
(b) means for attaching said support bar to a pallet;
(c) an elongated clamp bar having a clamp nose on one end thereof for engagement with a workpiece on the pallet to clamp the workpiece to the pallet;
(d) fulcrum means supported by said support bar and engaged with the other end of said elongated clamp bar;
(e) clamp screw means interconnecting said elongated clamp bar with sad support bar at a point between said clamp nose and fulcrum means;
(f) said elongated clamp bar is provided with a longitudinally extended recess on the lower side thereof and toward said other end thereof;



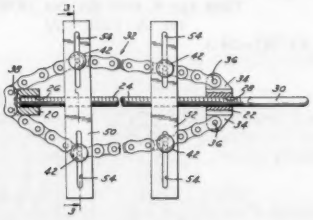
(g) said fulcrum means comprises a fulcrum clamp screw having a central body portion slidably mounted in a bore formed through the support bar, a head portion on the upper end thereof slidably mounted in said longitudinal recess in the lower side of said elongated clamp bar, and a lower end adjustably mounted in the outer end of the elongated support bar;
(h) the outer end of said support bar is bifurcated and includes means for forcing the parts of said bifurcated end together to retain said fulcrum clamp screw in fixed position in said support bar; and
(i) means for retaining said clamp screw means in said support bar against longitudinal movement relative to said support bar.

4,294,443

WORKPIECE RETAINER

Alex W. Sova, 19951 Houghton, Detroit, Mich. 48219

Filed Sep. 19, 1980, Ser. No. 188,892
Int. Cl.³ B25B *1/24*
U.S. Cl. 269—108 **7 Claims**



1. A device for holding irregular stones for the purpose of performing mechanical operations thereon which comprises:
(a) spaced support members,
(b) means mechanically associating said members operable to move said members toward and away from each other,
(c) a length of flexible member mechanically associated with a portion of each of said members to form a closed loop, said flexible member lying essentially in a single plane, said flexible member having two ends secured to one of

said support members and a portion passing around a portion of the other support member, and

(d) a plurality of means on said flexible member in opposed positions to engage a stone positioned in the loop of said flexible member,

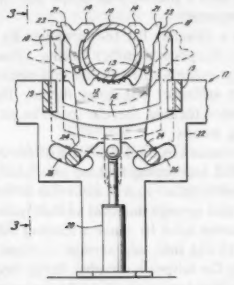
whereby when said members are moved away from each other the loop is tightened to secure a stone to said chain.

4,294,444

PIPE GRIPPING VISE

Herbert D. Horton, Mayhill, N. Mex., assignor to World Wide Oil Tools, Inc., Houston, Tex.

Filed Apr. 29, 1980, Ser. No. 145,367
Int. Cl.³ B25B *1/08*
U.S. Cl. 269—156 **2 Claims**



1. An apparatus for gripping pipe, said apparatus comprising:

a frame for supporting a pipe to be gripped;

a housing for supporting said frame;

at least two vise jaws pivotally mounted on said frame with a first vise jaw disposed on a first side of said pipe when said pipe is supported on said frame and with a second vise jaw disposed on a second side of said pipe when said pipe is supported on said frame;

a yoke having a first arm for slidably moving along a surface of said first vise jaw to cause said first vise jaw to pivot into gripping contact with said pipe and having a second arm for slidably moving along a surface of said second vise jaw to cause said second vise jaw to pivot into gripping contact with said pipe, said first and second arms of said yoke being slidably mounted within said housing so that the ends of said first and second arms of said yoke slidably communicate with said first and second vise jaws, respectively;

means for biasing said yoke with respect to said housing to cause the ends of the first and second arms of said yoke to press against said first and second vise jaws, respectively; and

means, mounted on said frame, for translating a rotational force acting on said pipe into a gripping force exerted on said pipe by said vise jaws.

4,294,445

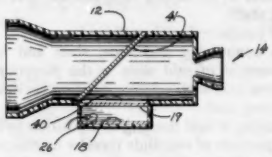
SIGHTING DEVICE WITH MEANS FOR REFLECTING AND SUPERIMPOSING LIGHT FLASHES ON A VIEWED OBJECT

Scott C. Crosbie, 4349 Brookside Ave., St. Louis Park, Minn. 55436

Filed Feb. 15, 1980, Ser. No. 121,807
Int. Cl.³ A63J *5/02*
U.S. Cl. 272—8 M **9 Claims**

9. In an amusement device, the combination, comprising;

viewing means for observing an object, said viewing means including an aperture for directing the viewing attention of an observer to said object and means for super-imposing a pattern of indicia on the field of view through said aperture, said means including opposed reflective surfaces and a light source, said pattern of indicia being comprised of individual



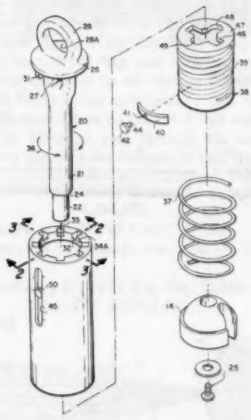
indicia of progressively increasing size with increasing distance from the view of said object observed through said aperture.

4,294,446

FRICTION TYPE EXERCISING DEVICE WITH IMPROVED FRICTION SETTING INDICATOR

Gerald L. Moore, San Jose, Calif., assignor to Ronald E. Useldinger, San Jose, Calif.

Filed Jul. 23, 1979, Ser. No. 59,899
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—133 **11 Claims**



1. An exercise device, comprising in combination:

a housing having an outer wall forming a hollow cavity, said housing having a central axis;

a shaft positioned within the cavity and held to allow axial and rotative movement relative to said housing when moved in one axial direction and preventing axial rotative movement relative to said housing when moved in the other axial direction;

a hub positioned in said cavity and fixed to said shaft to move axially therewith while allowing rotation of the shaft relative to said hub, said hub being nonrotatable with respect to said housing;

first and second openings in said hub;

a rope-like member extending through said first opening in the hub, around said shaft and out the second opening in said hub whereby when the rope-like member is pulled frictional resistance is exerted on said rope-like member in proportion to the number of turns around said shaft;

means attaching said rope-like member to the shaft whereby with relative rotation of the shaft and the hub, the number of turns of the rope-like member about the shaft is changed;

releasable means for holding the shaft against rotation relative to said housing which when released allows rotation of said shaft within said cavity thereby to change the number of turns said rope-like member is wound around said shaft;

a slide positioned with said cavity;

means connecting said slide, shaft and housing to cause movement of said slide in the direction parallel of the central axis with relative rotation between said shaft and housing; and

an opening in said housing in a position to allow viewing of the position of said slide thereby to indicate the number of turns said rope-like member is wound around said shaft.

4,294,447

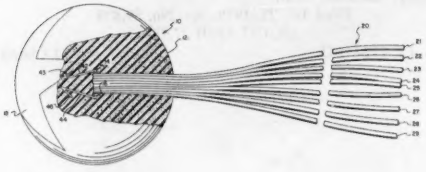
AERIAL AMUSEMENT PROJECTILE AND METHOD OF MANUFACTURE

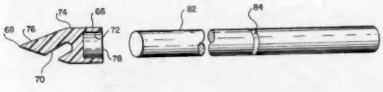
Merlin W. Clark, Rte. 1, Box 171, Spanish Fork, Utah 84660

Continuation-in-part of Ser. No. 19,050, Mar. 9, 1979, abandoned. This application Sep. 10, 1979, Ser. No. 74,222

Int. Cl.[3] **A63B** *43/00*

U.S. Cl. 273—58 R **15 Claims**





9. An aerial amusement projectile comprising:

an aerodynamic body fabricated as a solid shape from a penetrable, resilient, sponge material;

a streamer comprising a plurality of ribbons, the ribbons being fabricated from a flexible material; and

a fastener for securing the streamer to the aerodynamic body, the fastener being fabricated as a harpoon member having a penetrating means and a streamer engaging means to accommodate being inserted inside the aerodynamic body to thereby secure an end of the streamer inside the aerodynamic body, the harpoon member comprising a body having a base at one end and an apex at the other end, the fastener comprising an angular face on the base and a leading edge defined by the perimeter of the angular face, the angular face being positioned at the end of the fastener nearest the point of insertion on the aerodynamic body after the fastener has been inserted into the aerodynamic body, the angular face comprising a planar element forming an angle of less than 90° with the axis of the harpoon member so that pulling forces against said harpoon member cause the leading edge of said planar element to cut into said sponge material thereby accommodating the base causing the leading edge of the fastener to cut into the sponge material and thereby twist the harpoon member longitudinally under pulling forces exerted on the streamer, the apex allowing the body to be forceably inserted inside the aerodynamic body while the base inhibits its dislodgment of the harpoon member from the aerodynamic body.

14. A method for manufacturing an aerial amusement projectile comprising:

preparing an aerodynamic body from a solid mass of synthetic sponge material, the synthetic sponge material being resilient and penetrable, the body having a suitable aerodynamic profile;

obtaining a plurality of ribbons by cutting a flexible sheet material into a plurality of strips and bundling the strips into a streamer;

fabricating a fastener for the streamer by forming the fastener as a harpoon member having a base and a penetrating means extending from the end opposite the base and having a streamer engaging means, the base having a counterbore formed therein to serve as an insertion rod receiving means;

forming a slanted face on the base of the harpoon member, the slanted face being formed as a planar element angularly offset from an axis of insertion of said harpoon member into said sponge material so that pulling forces against said streamer tend to cause a leading edge of said planar element to cut into said sponge material thereby accommodating the harpoon member being longitudinally offset upon rearward movement of the harpoon member in the aerodynamic body;

mounting the streamer to the aerodynamic body by securing the streamer with the streamer engaging means of the fastener and by placing an insertion rod into the counterbore and inserting the insertion rod and fastener into the aerodynamic body so that the fastener is completely inside the aerodynamic body with the streamer extending from the aerodynamic body, the resilient material of the aerodynamic body resisting dislodgment of the fastener and the streamer from the body; and

rotating the fastener inside the aerodynamic body by pulling on the streamer and causing the base to cut into the resilient material of the aerodynamic body so as to provide better securement of the fastener thereto.

4,294,448

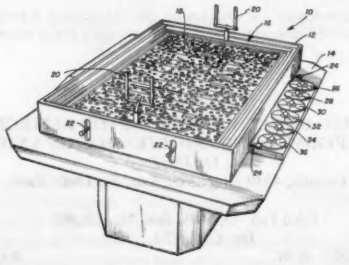
GAME APPARATUS

Newell B. Oler, 4323 Brown, Apt. 149, Dallas, Tex. 75219

Filed Jan. 21, 1980, Ser. No. 113,492

Int. Cl.[3] **A63F** *7/06, 7/10*

U.S. Cl. 273—94 **12 Claims**

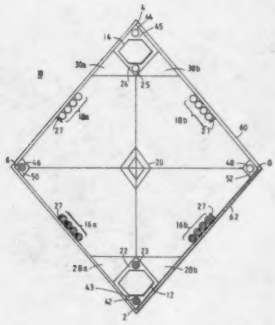


1. A game apparatus for use with a ball, which comprises:

an outer frame supported for pivotal movement about a first axis;

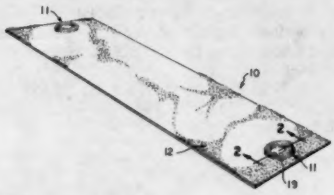
a first handle secured to said outer frame;
an inner frame supported within said outer frame for pivotal movement about a second axis perpendicular to said first axis;
a second handle secured to said inner frame;
a planar game board defining a playing field mounted on said inner frame, said board including a plurality of apertures therein sized to receive the ball, certain ones of the apertures being designated penalty apertures;
spring means for normally biasing said inner and outer frames to urge said game board toward a horizontal orientation;
a plurality of fences attached to said game board so as to define, together with the apertures therein, an obstacle course for the ball; and
spinner means for defining one of a plurality of predetermined rule infractions and penalties therefor to be applied when the ball enters a penalty aperture on said game board.

4,294,449
AMUSEMENT DEVICE
James K. Shaw, 4916 Erie St., Annandale, Va. 22003
Filed Oct. 13, 1978, Ser. No. 950,966
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—126 R **7 Claims**



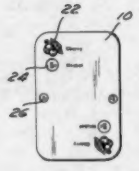
1. A game apparatus comprising: a substantially planar playing surface mounted atop a game table; vertical walls attached to the perimeter of said playing surface; indicia located substantially at the center of said playing surface; said surface having a plurality of corners; some of said corners having indicia and others of said corners having receptacles; the number of said corners being greater than the number of said receptacles, and said receptacles being dimensioned for receiving playing pieces used in conjunction with said game apparatus; a plurality of playing pieces; said playing pieces including separate sets of playing pieces for use by separate players, each of said separate sets of playing pieces having means for distinguishing it from the other sets; each separate set being divided into at least one pair of subsets whereby players using said subsets from the same separate set may play as partners; side indicia on said gameboard between a receptacle and one of said corner indicia; each of said side indicia being located adjacent said side walls to define a position at which at least one subset of said playing pieces is placed; each receptacle being placed a distance from said walls to define an area between said wall and said receptacle for receiving a playing piece therein; at least one cue piece, each receptacle having means adjacent thereto for defining an area whereby said at least one cue piece may be positioned.

4,294,450
GOLF TRAINING AID AND GAME
John Gallic, 151 Lenape La., Berkeley Heights, N.J. 07922
Filed May 2, 1980, Ser. No. 146,336
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—176 F **12 Claims**



1. A practice putting game comprising
a flexible base layer of predetermined length,
a plurality of smooth monofilament fibers locked into said base from the back and protruding through the front surface thereof to form a simulated golf green surface, said fibers having a predetermined essentially uniform first height above said base,
a continuous wear layer comprising a material having a high coefficient of friction covering the back of said base,
a group of upright fibers anchored in said wear layer and protruding from said base through said monofilament fibers to a substantially uniform second height above said first height, said group of upright fibers being arrayed in a circle to define a raised ring, said ring having a predetermined interior diameter on the surface of said green, and said upright fibers being substantially less resilient than said monofilament fibers to permit a ball rolling on said monofilament fibers to pass through the circle of said upright fibers and into the interior of said ring.

4,294,451
SLOT MACHINE CARD GAME
Robert A. Wollner, 5547 Yarmouth Ave., Apt. #9, Encino, Calif. 91316
Filed Aug. 27, 1979, Ser. No. 70,244
Int. Cl.³ A63F *1/00*
U.S. Cl. 273—308 **1 Claim**



1. A card game comprising:
a plurality of cards, said cards being divided into several different groups with there being ten in number of said groups, there also being an equal number of said cards within each of said groups, the basic format of the different card groups being similar, each said card having a first indicia with there being several different first indicias, each said first indicia comprising symbols from the group consisting of fruits, bar representations, enlarged single numerals, and a slot machine with only a single said object represented on a single card, each said group of cards having identical first indicia;
second indicia located on each card of said cards, said second indicia comprising monetary numerical values, there being different said monetary numerical values within each said group with each said card having only a single monetary value of said second indicia; and

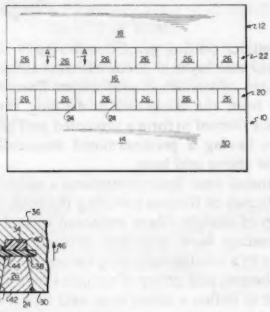
third indicia located on each of said cards within certain said groups of cards, said third indicia comprising different monetary numerical values with there being the identical monetary numerical value used entirely throughout each of said certain groups.

4,294,452

TARGET BACKSTOP

Harold J. Schlotter, Springfield, and Leroy Young, Sedalia, both of Mo., assignors to Champion International Corporation, Stamford, Conn.

Filed Nov. 29, 1979, Ser. No. 98,657
Int. Cl.³ F41J *1/00*
U.S. Cl. 273—403 **13 Claims**



1. A target backstop for supporting a target in which projectiles may be embedded comprising

a plug;

a wall member formed of corrugated material having a front face, a rear face, and at least one cavity formed therein opening on said front face, said cavity comprising a front portion adjacent said front face for receiving said plug and a rear portion remote from said front face;

a resilient member formed of a heavy rubberized material mounted in said rear portion to abut said plug when said plug is mounted in said front portion, said rear portion having a rear chamber on the side of said resilient member remote from said front face;

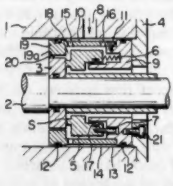
said plug being formed of corrugated material and adapted to be coupled releasably within said cavity.

4,294,453

MECHANICAL SEAL

Hiroshi Inouye, and Eiichi Sato, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 1, 1980, Ser. No. 136,368
Claims priority, application Japan, Apr. 4, 1979, 54-39827
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—22 **8 Claims**



1. A mechanical seal comprising:

a rotary sealing element rotatable with a shaft; and

a stationary sealing element secured to a casing through resilient means and recoil preventing means to cooperate with said rotary sealing element to form a sealed surface;

wherein the improvement comprises:

a stationary retainer located opposite said sealed surface with respect to said stationary sealing element for holding said stationary sealing element, said resilient means and said recoil preventing means;

a seal housing provided to said stationary retainer for enclosing said stationary sealing element; and

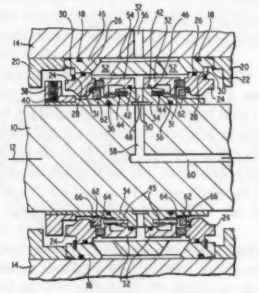
an inwardly projecting portion formed in said seal housing in a portion thereof near said sealed surface for preventing axial movement of said stationary sealing element which might otherwise be caused by the biasing force of said resilient means when the seal is disassembled, whereby the stationary retainer including said stationary sealing element, said resilient means and said recoil preventing means as well as said seal housing can be attached to and detached from the casing as a unit.

4,294,454

ROTARY SEAL UNIT

John A. Cannings, Midway, Crowe Hill, Limpley Stoke, Bath, Avon, England

Filed Jan. 30, 1980, Ser. No. 117,836
Claims priority, application United Kingdom, Feb. 5, 1979, 03907/79
Int. Cl.³ F16J *15/34*
U.S. Cl. 277—65 **4 Claims**



1. A rotary seal for establishing a seal between a shaft and a surrounding member with which the shaft is relatively rotatable, comprising:

an annular outer component adapted to be rotatable relative to the shaft;

an annular runner component adapted to be secured around the shaft;

a first sealing member carried by the outer component;

a second sealing member carried by the runner component;

one of said first and second sealing members being axially located on said component which carries it, the other of said first and second sealing members being axially slidable on said component which carries it;

spring means acting between said other sealing member and the component carrying said other sealing member to urge said other sealing member into sealing engagement with said one sealing member, thereby establishing an annular seal separating spaces on either side; and

a setting ring engaging axially between said components and rotatable relative to at least one of them so as to locate axially the two said components relative to each other while allowing them to rotate relative to each other, the setting ring being of a material of substantially different hardness from the material of a said component with which it is in rotatable axial engagement, so that after the seal has been running for some time the softer material

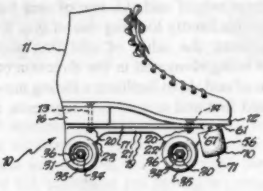
wears away to provide a clearance between the setting ring and at least one of said components.

4,294,455

ROLLER SKATE CONSTRUCTION

Arnold F. Krueger, Buffalo, N.Y., assignor to M & K Industries, Inc., Buffalo, N.Y.

Filed May 2, 1979, Ser. No. 35,242
Int. Cl.³ A63C *17/02, 17/14*
U.S. Cl. 280—11.2 **15 Claims**



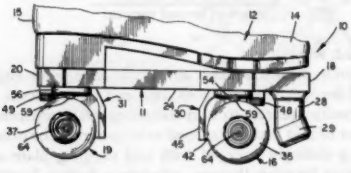
1. A roller skate construction comprising an elongated cast plastic body member including front and rear axle supporting portions, first and second bores in said front and rear axle supporting portions, respectively, first and second axles extending through said first and second bores, respectively, first and second axle supporting bolts extending perpendicularly through said first and second axles, respectively, in said front and rear axle supporting portions, respectively, first and second wear plates in said first and second bores, respectively, interposed between said first and second axles, respectively, and said front and rear axle supporting portions, respectively, for bearing the load of said first and second axles, respectively, said first and second axles including a rectangular solid central portion through which said first and second axle supporting bolts, respectively, extend, and flat planar portions defining the sides of said first and second bores and diverging away from said rectangular solid central portions on opposite sides of a plane extending perpendicularly thereto and passing through the axis of said first and second bolts, said flat planar portions providing limit stops for limiting pivotal movement of said first and second axles, respectively.

4,294,456

PIVOTABLE BALL SKATE

James L. Tuell, and Paul Wahnschaff, both of Atlanta, Ga., assignors to Tuell Industries, Inc., Atlanta, Ga.

Filed Nov. 13, 1979, Ser. No. 93,746
Int. Cl.³ A63C *17/02, 17/24*
U.S. Cl. 280—11.28 **5 Claims**



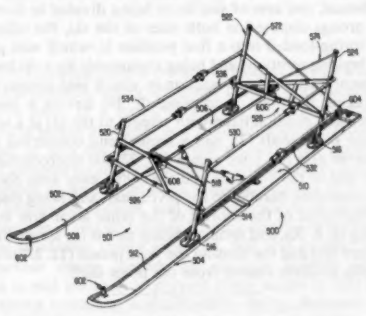
1. A roller skate comprising an elongated foot support platform having a front end and a rear end for mounting against the bottom surface of a shoe or the like with its front end adjacent the toe of the shoe and the rear end adjacent the heel of the shoe, a front roller assembly mounted to said foot support platform adjacent the front end of said foot support platform, a rear roller assembly mounted to said foot support platform adjacent the rear end of said foot support platform, at least said front roller assembly comprising a roller support bracket including a support plate portion in abutment with the foot support platform and an axle support projection extending from said support plate, an axle extending outwardly to opposite sides of said axle support projection and rollers mounted on said axle with one roller on each end of said axle, said rollers each being approximately of similar size and hemispherical in shape with their larger diameters positioned in juxtaposition with respect to said support projection, a pivot connector pivotally connecting said support plate portion of said roller support bracket to said foot support platform at a position of said support plate which is longitudinally offset from said axle so that when a lateral force is applied to said rollers the rollers tend to pivot about said pivot connector out of alignment with said foot support platform, and restraining means comprising a resilient pad positioned on each side of said roller support bracket and attached to said foot support platform, said resilient pads being offset longitudinally along the length of said foot support platform with respect to said pivot connector for resiliently maintaining said rollers in alignment with said foot support platform, and means for connecting said resilient pads to said foot support platform at a multiple number of positions along the length of said foot support platform.

4,294,457

COLLAPSIBLE SUPPORT DEVICE FOR A FOLDING SLED

Robert Thiboutot, Lac St. Charles, Canada, assignor to Les Entreprises Rotot Ltee, Comte de Bellechasse, Canada

Division of Ser. No. 960,444, Nov. 13, 1978, Pat. No. 4,245,849.
This application Apr. 11, 1980, Ser. No. 139,206
Int. Cl.³ B62B *13/16*
U.S. Cl. 280—20 **2 Claims**



1. A sled which is collapsible in height and in width, the sled having a pair of spaced apart foldable runners and collapsible support structure pivotally connected to the runners for pivotal movement about axes extending transversely to the longitudinal axes of the runners, said collapsible support structures comprising:

a. a first collapsible support structure forming the back of said sled;

b. a second collapsible structure forming the front of said sled;

wherein each of said collapsible support structures has

(1) a first and a second support member pivotally connected to a respective runner and positionable in an upright position;

(2) a collapsible support mechanism interconnecting said support members and movable between a collapsed position in which the support members are adjacent to each other and an erected position in which the support members are spaced apart from each other;

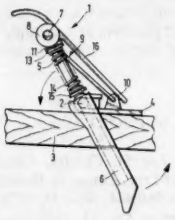
(3) side members, generally parallel to said runners, interconnecting the support members forming the said front and back of said sled; and

(4) diagonal members interconnecting each of said runners with the support members not privotally connected thereto so that pivotal movement of said support members towards said runners moves said runners towards each other, said diagonal members being adapted to support said support members in upright positions.

4,294,458
SKI STOP

Gerhard Sedlmayr, Farchant, Fed. Rep. of Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Nov. 16, 1978, Ser. No. 961,458
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 2751602
Int. Cl.³ A63C 7/10
U.S. Cl. 280—605 **10 Claims**



1. A ski stop in the form of a two-armed lever having a extending transversely to the length of a ski on an upper surface thereof, one arm of said lever being divided to form two brake prongs disposed at both sides of the ski, the other arm being spring-loaded into a first position in which said prongs are in braking positions and being engageable by a ski boot for movement into a second position in which said prongs are in non-braking positions, a coupling (**9**, **10**) having a first end mounted at a position fixed with respect to the ski at a spacing from the pivot shaft (**2**), and a second end connected to the other lever arm (**5**), yoke means (**12**, **23**) for intercoupling the second end of the coupling and the other lever arm, the yoke means extending parallel to the pivot shaft and being displaceable lengthwise of the shorter of the other lever arm and the coupling (**5**; **9**, **20**), and spring biassing means for spring loading said other arm and for biassing the yoke means (**12**, **23**) towards a limiting position remote from the pivot shaft.

4,294,459
SKI BRAKE

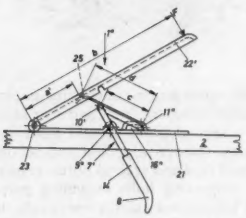
Josef Svoboda, Schwechat; Erwin Krob, Vienna, and Erwin Weigl, Brunn am Gebirge, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Division of Ser. No. 896,216, Apr. 13, 1978, Pat. No. 4,272,099. This application Nov. 7, 1979, Ser. No. 92,139
Claims priority, application Austria, Apr. 18, 1977, 2678/77
Int. Cl.³ A63C 17/10
U.S. Cl. 280—605 **1 Claim**

1. A support structure for mounting a ski brake on a ski adjacent to a safety ski binding means also mounted on said ski, comprising:

a mounting plate mounted on said ski and having means defining first and second axle receiving openings thereon spaced along the longitudinal axis of said ski;

a U-shaped, spring wire ski brake means having a pair of brake arms located along opposite side edges of said ski interconnected by a first bight portion, each of said brake arms having a first axle segment therein received in said first axle receiving opening, said first bight portion including an integral U-shaped central segment opening outwardly in a direction opposite to the opening of said U-shaped, brake means to thereby define two laterally spaced second bight portions located on opposite lateral sides of said U-shaped central segment, said U-shaped central segment having a third bight portion defining a second axle segment received in said second axle receiving opening, said first and second axle segments supporting said ski brake means for pivotal movement between a braking position wherein said brake arms extend at a transverse angle to the bottom surface of said ski and a retracted position wherein said brake arms extend generally parallel to the upper surface of said ski, said first and second axle segments extending perpendicular to the longitudinal axis of said ski, one of said first and second axle openings fixedly locating one of said first and second axle segments, the other of said first and second axle openings being elongated in the direction of said longitudinal axis of said ski to facilitate a sliding movement of said one of said first and second axle segments; and



stepping plate means pivotally mounted for movement about a pivot axle on said mounting plate by a pivot axle support, said stepping plate means including guide means for slidably supporting thereon said second bight portions, said second bight portions sliding along said guide means toward said pivot axle support during a movement of said ski brake means from said braking position toward said retracted position to thereby reduce the force required to hold said stepping plate in a position parallel with the upper surface of said ski,

said second bight portions' contact location being located on said stepping plate and divides the length of said stepping plate into two segments, a first segment extending between the pivot axle support and said location and a second segment extending between said location and an end of said stepping plate remote from said pivot axle whereat an external force is to be applied, whereby as said stepping plate is urged to said parallel position with said upper surface of said ski, the value of a ratio

$$\frac{\text{length of first segment}}{\text{length of second segment}}$$

is reduced; and

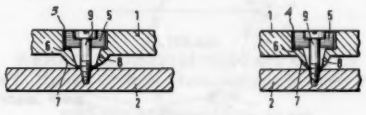
said guide means includes an intermediate lever engaging said second bight portions, one end of said lever being pivotally secured to said mounting plate adjacent said other of said first and second axle openings, the other end being slidingly engaged with said stepping plate at said contact location thereon, wherein a further location of said second bight portions' contact location on said lever divides the length of said lever into third and fourth segments, said third segment extending between the pivotal support for said lever and said further location, said fourth segment extending between said further location and an end of said lever engaging said stepping plate at said contact location thereon whereby as said stepping plate is urged to said parallel position with said upper surface of said ski, the value of said ratio is further reduced.

4,294,460

FOOT-PLATES FOR SKI-BINDINGS

Bernhard Kirsch, Im Litzelholz 23, 5500 Trier-Biewer, Fed. Rep. of Germany

Filed Nov. 14, 1978, Ser. No. 960,662
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752206
Int. Cl.³ A63C 9/00
U.S. Cl. 280—607 17 Claims



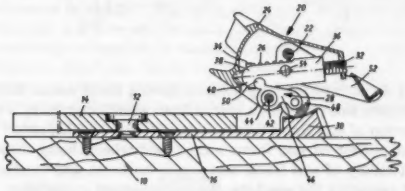
1. In a ski assembly, a foot-plate member for carrying a ski-binding, a substantially rigid member including a ski and rigid pin means including at least one rigid pin rigidly connected to said ski, said rigid pin having a portion projecting upward from the ski, said foot-plate member having an upright recess receiving said rigid pin projecting portion which recess is of a cross-sectional size substantially larger than the cross-sectional size of said rigid pin projecting portion in said recess for enabling movement during skiing of said foot-plate member relative to said ski a substantial distance in all directions laterally of the direction of projection of said rigid pin projecting portion, the upright sides of said recess limiting the maximum range of lateral movement of said foot-plate member relative to said substantially rigid member, and resilient means including at least one pad of resilient material interposed between said substantially rigid member and said foot-plate member for cushioning lateral movement of said foot-plate member relative to said substantially rigid member throughout the full range of relative lateral movement of said two members permitted by said rigid pin projecting portion in combination with the upright sides of said foot-plate member recess for cushioning the transmission of lateral forces exerted on said ski from being directly transmitted to said foot-plate member.

4,294,461

SAFETY SKI BINDING COMPRISING A SOLE PLATE

Erich G. Eckart, Angererstr. 36, 8000 München 40, Fed. Rep. of Germany

Filed Nov. 19, 1979, Ser. No. 95,441
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1978, 2851634
Int. Cl.³ A63C 9/081
U.S. Cl. 280—618 8 Claims



1. A safety ski binding comprising:

a sole plate pivotally connected to a ski by a trunnion approximately below the heel position of a skier;

a heel assembly on said sole plate adapted to pivot about a first axis transverse to said ski, said assembly being connected to a holder member having means for engaging the heel of a user for maintaining that heel of the sole plate;

spring means urging said assembly to pivot about said axis in a direction to maintain a heel on the sole plate; said spring means including a carriage biased by spring force to a normal position;

a curved cam member rigidly attached to the ski;

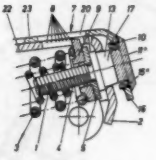
a double-armed rocker pivotally mounted on said assembly about an axis extending laterally perpendicular to the ski, one arm of said rocker being rearwardly directed and being formed to define a cam follower engaging said curved cam member, the other arm of said rocker being pivotally connected to said carriage whereby said spring means biases said carriage to pivot said rocker and hold said cam follower against said curved cam member in a region thereof wheren said holder members holds the heel on the sole plate and said sole plate is held against free rotation on said ski.

4,294,462

SPRING LOCKING DEVICE

Josef Svoboda, Schwechat; Herbert Wuerthner, Hainburg, and Karl Stritzl, Vienna, all of Austria, assignors to TMC Corporation, Baar, Switzerland

Division of Ser. No. 900,302, Apr. 26, 1978, Pat. No. 4,213,630.
This application Dec. 21, 1979, Ser. No. 106,054
Claims priority, application Austria, Apr. 27, 1977, 2929/77
Int. Cl.³ A63C 9/08
U.S. Cl. 280—634 4 Claims



1. The combination of a release ski binding having a housing and an adjustable spring abutment thereon for changing the effective force of a spring in said ski binding housing, said adjustable spring abutment being initially exposed through an opening in said ski binding housing, and a seal member of brittle material for indicating that an adjustment of said adjustable spring abutment has taken place subsequent to an authorized adjustment thereof, said seal member being received in said opening in said ski binding housing directly in the pathway to said adjustable spring abutment, said seal member having destructible means thereon for securely holding said seal means in said pathway to prevent ready access to said adjustable spring abutment, said adjustable spring abutment means being adjustable only through a destruction of said destructible means, said adjustable spring abutment being threadedly coupled to said ski binding housing and having means thereon for receiving an adjustment tool therein, said destructible means on said seal member being positioned between said adjustable spring abutment and said ski binding housing whereby an axial movement of said adjustable spring abutment in response to a rotary movement thereof in said threaded coupling beyond a predetermined limit will cause a destruction of said destructible means.

4,294,463

COLLAPSIBLE LUGGAGE CARRIER

Hirotaro Kotani, No.2-4, Ayameike-cho Minami-6-chome, Nara-shi, Nara-ken, 631, Japan

Filed Oct. 10, 1979, Ser. No. 83,368
Int. Cl.³ B62B 1/00
U.S. Cl. 280—646 11 Claims

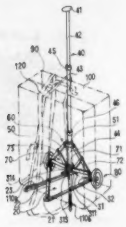
1. A portable luggage carrier collapsible into the form of a bundle comprising:

a base platform frame including a pair of first links each pivotally connected to the other at one end and angular expansible and collapsible and a pair of second links each

pivoted to the midporton of one of the first links approximately at one end portion of each second link intersecting said first link, the second links being pivotally connected to each other at the other ends thereof and being angularly expansible and collapsible, the base platform frame being adapted to receive luggage thereon for transport;

a back frame including a collapsible handle bar pivotally connected at its lower portion to said other ends of the pair of second links and having the handle member at its upper portion and a pair of third links each pivotally connected approximately at one end portion thereof to a portion of one of the first links close to its free end and having the other ends pivotally connected to each other and also connected to the handle bar, the third links being angularly expansible and collapsible, the back frame being unfoldable to a position at least at a right angle with the base platform frame and foldable over the base platform frame, the back frame being laterally expansible and collapsible in operative relation with the base platform frame when folded over the base platform frame;

first hinge means pivotally connecting the handle bar to the second links as pivotal movement for pivotally connecting the base platform frame to the back frame and provided with movement compensating means for compensating



for the expanding or collapsing movement of the pair of second links relative to each other so as to be serviceable as the pivotal movement;

a pair of second hinge means pivotally connecting the first links to the third links as said pivotal movement and provided with movement compensating means for compensating for the operatively related expanding or collapsing movement of the pair of the first links relative to each other and of the pair of the third links relative to each other so as to be serviceable as said pivotal movement, said back frame being pivotally connected to said base platform frame at no more than three locations by said first hinge means and said pair of second hinge means;

expanding means for holding both the frames in a laterally expanded position and for permitting the back frame to independently retain the shape to which the back frame is expanded laterally along with the base platform frame as folded over the base platform frame, also when the back frame is in its unfolded position approximately at right angle with the base platform frame; and

a pair of wheels being mounted at a first pivot on the first links to the rear of a second pivot position where the third link is pivotally connected to the first link, and so as to be positioned on lateral side portions of the first links when the base platform frame is in a horizontal position.

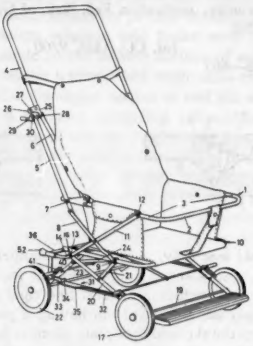
4,294,464

CHILD'S STROLLER

John P. Ettridge, 235 Diagonal Rd., Warradale, Australia (5046)

Filed Feb. 14, 1979, Ser. No. 11,794
Claims priority, application Australia, Feb. 17, 1978, PD3427
Int. Cl.³ B62B *7/06*
U.S. Cl. 280—649 **6 Claims**

1. A child's stroller comprising an upper horizontal frame, a lower horizontal seat frame, a pantograph linkage connecting the said frames, an articulated handle connected to the upper frame and also to a first arm of the pantograph linkage, a second arm of the pantograph linkage connected to a first wheel frame having wheels, a second wheel frame having wheels and link means extending between and interconnecting



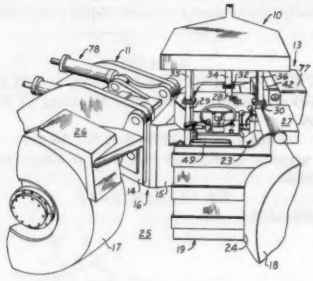
said wheel frames, so that on collapsing said stroller said handle folds onto the upper frame and said upper frame moves in parallel manner to be adjacent said seat frame, said link means moving said first wheel frame wheels towards the second wheel frame wheels.

4,294,465

OPERATOR'S STATION AND MOUNTING

Gerald P. Simmons, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 859,361, Dec. 13, 1977, abandoned.
This application Jun. 9, 1980, Ser. No. 157,332
Int. Cl.³ B62D *33/06*
U.S. Cl. 280—756 **7 Claims**



1. In an earthworking machine having frame means defining opposite side portions, a pair of front wheels carried by a front portion of said frame means, a pair of rear wheels carried by a rear portion of said frame means, said wheels being disposed outwardly of said frame means side portions, and mechanism for operating the machine, the improvement comprising:

wall means defining an upwardly open operator's station;

means for securing said wall means to one of said frame side portions to dispose said operator's station outwardly thereof between a front wheel and rear wheel;

a protective canopy mounted to said frame inwardly of said operator's station and including a cantilevered portion overlying and being unsupported by the operator's station outwardly of the frame for protecting the operator in said station from injury by falling objects and permitting substantially unobstructed viewing forwardly, rearwardly and outwardly from said station, said frame being pro-

vided with connector portions on the opposite side portions thereof, said canopy being provided with depending leg portions arranged to be connected to said connecting portions; and

bolt means for removably securing said leg portions to said connector portions to removably support the canopy at each of the opposite sides of the frame, the canopy being supported to the frame side portion opposite that to which the operator's station wall means is secured by only one of said leg portions.

4,294,466

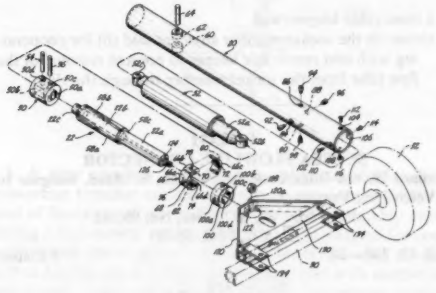
WEIGHT REDISTRIBUTION APPARATUS

Dennis C. Hyman, Olympia, Wash., assignor to Molly Presley, Olympia, Wash.

Filed Oct. 4, 1979, Ser. No. 81,858

Int. Cl.³ B62D *9/02*

U.S. Cl. 280—772 **9 Claims**



1. An apparatus for redistributing the weight of a vehicle as said vehicle negotiates a turn, said vehicle including a frame, two front wheels, and two rear wheels, comprising:

a pair of relatively telescoping elements, a first of said elements being affixed to said frame, the second of said elements being operatively coupled to said two front wheels to mount said front wheels for fore and aft longitudinal movement relative to said frame,

means associated with said elements for axially rotating said second element in a predetermined direction relative to said first element as said elements telescope, said second element being operatively coupled to said front wheels to alter the relative elevation of said wheels as said second element rotates relative to said first element,

biasing means operatively coupled between said telescoping elements to bias the telescoping movement of said second element in a forward direction, said biasing means being resiliently collapsible in reaction to exertion of a turning force on said front wheels to allow said second element to telescope relative to said first element, to thereby effect an elevation differential in said front wheels relative to said frame in reaction to said turning force.

4,294,467

SEAT BELT COMFORT DEVICE

Richard L. Frantom, Richmond, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Oct. 5, 1979, Ser. No. 82,397

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—801 **17 Claims**

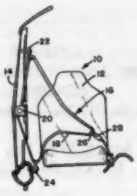
1. A vehicle seat belt system comprising:

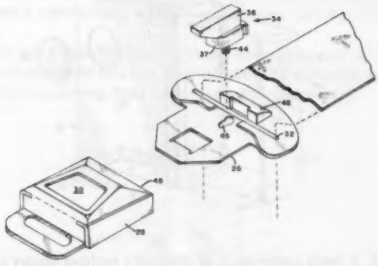
seat belt webbing adapted to at least extend over the torso of an occupant seated in a seat in said vehicle;

rewind means exerting a biasing force and biasing said webbing in a rewind direction and permitting extension of said webbing against said biasing force, said biasing force causing said webbing to exert pressure against the torso of said occupant;

a tongue and buckle assembly associated with said seat belt webbing to provide a releasable interconnection for fastening said webbing about said occupant; and

comfort means associated with said tongue and buckle assembly and actuable to at least reduce the pressure exerted by said webbing against the torso of said occupant;





said comfort means comprising a contact means for contacting said webbing, said contact means normally being located at a first position at which said webbing is not contacted by said contact means, said contact means being manually movable to a second position at which said webbing is contacted, said contact means including means responsive to release of said tongue from said buckle to automatically move said contact means from said second position to said first position to thereby automatically disengage said comfort means.

4,294,468

SEATBELT SYSTEM

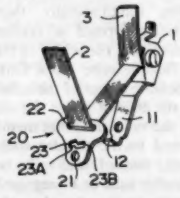
Eiichi Kinaga, Toyota, and Mamoru Mori, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 8, 1979, Ser. No. 47,140

Claims priority, application Japan, Aug. 24, 1978, 53-116464[U]

Int. Cl.³ B60R *21/02*

U.S. Cl. 280—807 **2 Claims**



1. In a vehicle seatbelt system having a retractor fixedly mounted to said vehicle, a lap slip anchor rotatably mounted to

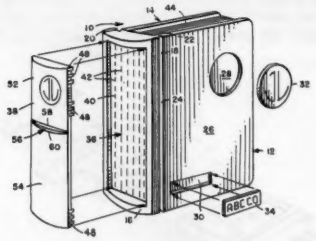
said vehicle subjacent said retractor and a seatbelt wound into and out of said retractor, and slideably received by said slip anchor, the improvement comprising means for preventing said slip anchor from rotating beyond a predetermined range wherein smooth extension and retraction of said seatbelt is assured, said preventing means including a slot in said slip anchor and a pawl fixed relative to said vehicle and extending into said slot, the dimension of said slot relative to said pawl enabling said anchor to rotate relative to said pawl within said range.

4,294,469

BOOK BINDERS AND BOOKS MADE WITH SAID BINDERS

Dominic R. Errichiello, 389 Meadowlark Rd., Bloomingdale, Ill. 60108

Filed Aug. 6, 1979, Ser. No. 63,859
Int. Cl.³ B42F *15/04*
U.S. Cl. 281—29 **4 Claims**



1. A book comprising an integrally molded binder of a thermoplastic polymer having a spine with a substantially planar, longitudinal panel portion and a front cover panel and rear cover panel respectively hingedly mounted on opposite, longitudinal sides of said spine by means of a living hinge formed between each of said cover panels and respective longitudinal sides of said spine; and paper pages positioned in said binder between said cover panels, one edge of said pages being fastened to said planar panel portion of said spine by means of stitching or stapling extending through said pages and said planar panel portion.

4,294,470

IN-LINE TUBE JUNCTIONS

Alfred D. Tucker, Kersbrook, Australia, assignor to Reed Irrigation Systems Pty Ltd., Australia

Filed Dec. 7, 1979, Ser. No. 101,275
Claims priority, application Australia, Dec. 11, 1978, PD7073; Jun. 1, 1979, PD9044
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—5 **2 Claims**

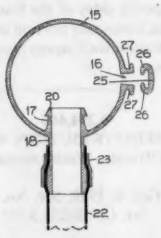
1. An in-line tube junction for joining a first flexible tube to a lateral tube, said in-line tube junction comprising:

an open-ended, tubular socket member having a socket passage extending longitudinally therethrough, said socket member being formed of resilient material and having a longitudinal slit, the width of the slit being sized so that the first flexible tube when flattened can be inserted into the socket passage of the tubular socket member through the slit at least when the slit is increased in width by flexing the tubular socket member;

a hollow spike joined to the tubular socket member and projecting inwardly thereof, said spike being arranged to pierce the first flexible tube or to engage in an aperture in the first flexible tube to thereby place the hollow of the spike into communication with the interior of the first flexible tube;

a hollow take-off projecting outwardly from the tubular socket member adjacent said spike, the hollow of said take-off communicating with the hollow of the spike;

means for coupling the lateral tube to the take-off whereby fluid can flow from the first tube to the lateral tube through the spike and the take-off;



a removable keeper; and

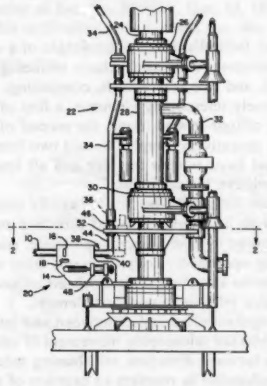
means on the socket member adjacent said slit for cooperating with said removable keeper to prevent removal of the first tube from the socket member through the slit.

4,294,471

SUBSEA FLOWLINE CONNECTOR

Bernard H. van Bilderbeek, Monymusk, Scotland, assignor to Vetco Inc., Ventura, Calif.

Filed Nov. 30, 1979, Ser. No. 99,183
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—24 **3 Claims**



1. An apparatus for connecting a horizontal subsea flowline having a first sealing surface at one end thereof, to a generally vertical production riser comprising: means for holding an end of said flowline at a predetermined location; a rigid tubular spool piece having, a generally horizontally extending portion, a generally vertically extending portion, and a second sealing surface at the end of said horizontal portion and adapted to mate with said first sealing surface; guide means for guiding movement of the end of the horizontal portion of said spool piece substantially perpendicular to said second sealing surface, and for guiding movement of the end of the vertical portion of said spool piece in a manner to maintain it a fixed distance from the end of the horizontal portion of said spool piece; means for stroking said entire spool piece in a manner producing the guided movement of said spool piece; and stab means for stabbing and sealing the vertical riser on the upper end of said vertically extending portion of said spool piece.

4,294,472

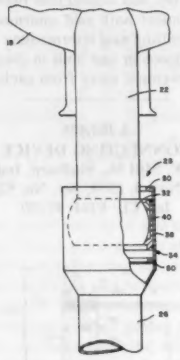
PIPE COUPLING ASSEMBLY ESPECIALLY SUITABLE FOR USE IN THE NUCLEAR REACTOR

William E. Stolecki, East Longmeadow, Mass., assignor to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 25, 1979, Ser. No. 51,805

Int. Cl.³ F16L *27/04*

U.S. Cl. 285—27 **12 Claims**



1. A pipe coupling assembly especially suitable for fluid connecting together certain components submerged within a pool of liquid metal in a nuclear reactor, said assembly comprising a first tubular section having one end adapted for connection with one of said reactor components, a second tubular section having one end adapted for connection with another of said reactor components, a third intermediate tubular section and first and second joint arrangements for respectively connecting one end of said intermediate section with the otherwise free end of said first second and the opnosite end of said intermediate section with the otherwise free end of said second section, said first joint arrangement forming the connecting ends of said first and intermediate sections and including a male portion having an outer partially spherical contour, an associated female portion including means interconnected with said male portion for providing limited axial and pivotal movement between said first and intermediate tubular sections and means for interlocking said male and female portions together, said interconnecting means including an outer cylindrical housing and a concentric inner cylindrical sleeve shorter in length than said outer housing and slidable within and against the inner surface of said housing along a longitudinal section of the latter, said housing and sleeve being positioned around their associated male portion for pivotal movement about the latter, said second joint arrangement forming the connecting ends of said second and intermediate sections and including a male portion having an outer partially spherical contour and an associated female portion including means supporting said last-mentioned male portion for pivotal movement.

4,294,473

DEVICE AT MUTUALLY LOCKABLE FIRST AND SECOND PARTS

Kjell R. Ekman, Zug, Switzerland, assignor to Ekman Engineering AG, Switzerland

Filed Mar. 12, 1980, Ser. No. 129,804

Claims priority, application Switzerland, Mar. 20, 1979, 02488/79

Int. Cl.³ F16L *55/00*

U.S. Cl. 285—50 **10 Claims**

1. An improved coupling device for providing a fluid-tight connection between a source of fluid and a hollow conduit unit having an enlarged cavity for receiving said coupling device, and comprising:

a first coupling member having a fluid passageway extending therethrough;

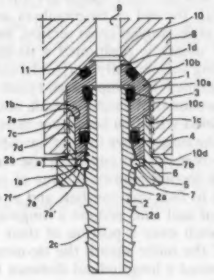
a second coupling member having a fluid passageway extending therethrough;

said first and second coupling members each having on a respective first end portion thereof means for permitting insertion of said second coupling member into said first coupling member, thereby aligning said flow passageways extending therethrough;

at least one sealing ring means compressed between confronting surface portions of said first and second coupling members for preventing the flow of fluid between said coupling members while simultaneously surpressing the transmission of vibrations through said coupling device;

said first coupling member further having on a second end portion thereof means for permitting free insertion of said first coupling member into an enlarged cavity in a hollow conduit unit until said second end portion abuts a portion of an end wall of said enlarged cavity and an exterior surface portion of said first coupling member is radially spaced from a surface portion of said enlarged cavity a distance sufficient to create a substantially cylindrically-shaped slot therebetween;

at least one additional sealing ring means contacting said abutting portions of said first coupling member and said enlarged cavity for preventing fluid from leaking therebetween;



a hollow nut assembly including on a first portion thereof means for permitting insertion of said nut assembly into said cylindrically-shaped slot a sufficient distance such that an end surface of said hollow nut assembly abuts a radially extending wall portion of said first coupling member and a second end portion of said hollow nut assembly overlaps and faces a substantially radially extending end wall of said first coupling member, defining a circumferentially extending locking slot therebetween;

said hollow nut assembly including attachment means engaging complimentary attachment means formed on said hollow conduit unit for fixedly positioning said hollow nut assembly within said substantially cylindrically-shaped slot;

a substantially ring-shaped locking member formed of resilient material extending partially into said circumferentially extending locking slot and confronting a circumferentially extending stop assembly formed on an exterior surface of said second coupling member; and

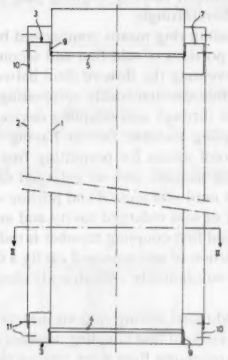
said second end portion of said hollow nut assembly including wall means for engaging and biasing said substantially ring-shaped locking member into tight frictional contact with said stop assembly, thereby preventing inadvertent withdrawal of said second coupling member from said first coupling member.

4,294,474

PREFABRICATED CHIMNEY-SHAFT

Josephus J. D. Harm, Vijzelgracht 29-31, Amsterdam, Netherlands

Filed Sep. 25, 1978, Ser. No. 945,234
Int. Cl.³ F16L *39/00*
U.S. Cl. 285—133 R **5 Claims**



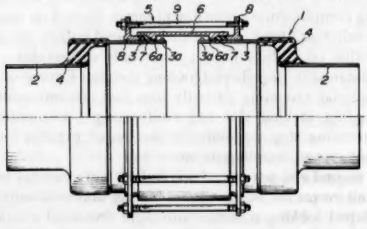
1. A prefabricated chimney-shaft comprising an inner sheath and an outer sheath surrounding said inner sheath, in which the inner sheath and the outer sheath are interconnected near their two ends with the aid of tie-members and at least the outer sheath has a multi-angled cross section, and near each said end of the outer sheath is positioned a tie-member comprising a plate extending substantially perpendicular to the longitudinal axis of the chimney, the shape of said plate being adapted to the inner cross-section of the outer sheath, and at its periphery said plate is provided with first bent-over rims for joining the outer sheath, and the tie-member further has a passage bounded by a second bent-over rim for engaging the inner sheath, such that said first and second bent-over rims of each said tie-member are arranged to face one another, and at one end of the outer sheath both of said rims project a longitudinal distance out of the outer sheath over a portion of their height and near the other end of the outer sheath the tie-member and both of its rims are recessed a longitudinal distance from said other end.

4,294,475

FLEXIBLE PIPE CONNECTOR

Isamu Kanai, Sayama; Shigeki Okubo, Yokosuka; Kazuo Tsuchiya, Ebina, and Toshio Takasaki, Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,262
Claims priority, application Japan, Nov. 10, 1978, 53-154012[U]
Int. Cl.³ F16L *15/02*
U.S. Cl. 285—165 **5 Claims**



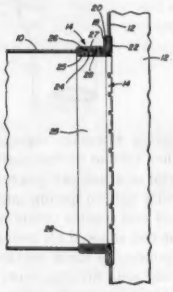
1. A flexible pipe connector comprising; a pair of connection pipes arranged on the same axial line and spaced apart from each other, a pair of intermediate sleeves each having one end portion overlapped with each of said connection pipes and coaxially arranged therewith, each of said intermediate sleeves being provided at its opposed end portion with projections defining abutments limiting axial movement of said intermediate sleeves away from each other, a rubber-like elastic body filling up a gap formed between each of said intermediate sleeves and each of said connection pipes and bonding the former with the latter, and connection fitting means to fluid-tightly seal and connect both said intermediate sleeves with each other and permitting said intermediate sleeves to slidably move in the axial direction and limit in cooperation with said projections said movement away from each other.

4,294,476

CONNECTING DEVICE

Patrick L. Nash, 7 E. Mill St., Shelburn, Ind. 47879

Filed Nov. 8, 1979, Ser. No. 92,929
Int. Cl.³ F16L *41/00*
U.S. Cl. 285—189 **13 Claims**



1. A connecting device for anchoring a duct segment to an opening in a wall, the duct segment having a peripheral edge portion closely receivable into the opening, the connecting device being formable of integral construction from a metal sheet of substantially uniform thickness and comprising a plurality of strips defined by bending said sheet along crease lines, the strips including first and second gripping strips and first and second flange strips, said first and second gripping strips being adapted for grippingly fitting over said peripheral edge portion of the duct, said first and second gripping strips being connected to said first and second flange strips along a joint and being substantially orthogonally aligned to said second flange strip and in parallel alignment with said first flange strip, said first and second flange strips being positioned to abut against said wall in close proximity to the opening, said first flange strip including a plurality of tabs substantially orthogonally aligned to said second flange strip and being manually bendable around said opening to a position parallel to said second flange strip with the portion of the wall immediately adjacent said opening included therebetween, whereby secure anchoring of the duct to the wall around said opening is effected.

4,294,477

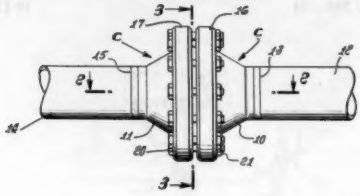
FLEXIBLE RING GASKET RETAINER FOR FLANGED CONNECTORS

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Inc., Ventura, Calif.

Continuation of Ser. No. 804,584, Jun. 8, 1977, abandoned. This application May 29, 1979, Ser. No. 42,461
Int. Cl.³ F16L *17/06*
U.S. Cl. 285—336 **18 Claims**

1. In a connector: a pair of connector bodies having a fluid passage therein when said bodies are connected together, said

bodies having opposed radial surfaces with circumferentially continuous grooves circumscribing said fluid passage and defined between inner and outer side walls converging outwardly from the bottom of the groove, a metal gasket ring in said grooves in sealing and radially inwardly loaded engagement with at least said outer side walls, retainer means carried by one of said bodies, means connecting said retainer means to said gasket ring and initially holding said gasket ring in position



with respect to the groove in one of said bodies to be clamped between said bodies in said grooves with at least said outer side walls loaded against said gasket ring, and means independent of said retainer means clamping said bodies together, said means connecting said retainer means to said gasket ring being flexible to enable movement of said gasket ring during loading thereof, said radial surfaces engaging said retainer means to limit the loading of said gasket ring by said side walls.

4,294,478

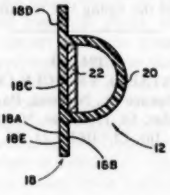
DETACHABLE PROTECTOR FOR STEEL OBJECTS

Russell C. Marquette, 2415 E. 15 St., Tulsa, Okla. 74104

Continuation of Ser. No. 867,239, Jan. 6, 1978, abandoned. This application Mar. 19, 1979, Ser. No. 22,215

Int. Cl.[3] **B60R** *19/08*

U.S. Cl. 293—128 **2 Claims**



1. An improved detachable protector for steel objects comprising:

an elongated body formed of magnetic plastic material which adheres to metal, such as steel, the body in cross-section being defined by a thin flat part having an upper and a lower surface and an arcuate part extending from the flat part upper surface, the width of the arcuate part being less than the width of the flat part, said flat part has side portions along each side of said arcuate part and a mediate portion substantially equal to the internal width of the arcuate part, said portions of said flat part extending along each side of said arcuate part are integral with said arcuate part and wherein the intermediate portion of said flat part is a separate element bonded to said arcuate part, the lower surface being planar; and

a thin elongated flat paramagnetic metal member of length substantially equal to the length of the detachable protector, positioned within said arcuate part and in close engagement with the upper surface of the intermediate portion of said flat part, said metal member having width substantially equal to the internal width of the arcuate part at point adjacent the intermediate flat part upper surface.

4,294,479

SAFETY LIFTING HOOKS

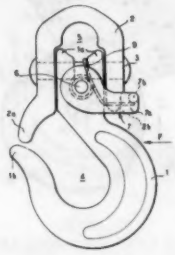
Jean-Francois Archer, Villennes, France, assignor to Stas Societe Technique d'Accessoires Specialises S.A., Sartrouville, France

Filed Jan. 17, 1980, Ser. No. 112,822

Claims priority, application France, Jan. 25, 1979, 79 02691

Int. Cl.[3] **B66C** *1/36*

U.S. Cl. 294—82 R **10 Claims**



1. A safety hook comprising means defining a hook body having an upper part and a hook nose lying in a plane, a generally U-shaped latch having two opposed noses, first spindle means pivotally mounting the latch on the upper part of the hook body, said first spindle means lying in the plane of the hook body and horizontal in the normal position of utilization of the hook, so that the latch can occupy a safety position in which one of its noses is situated in the vicinity of the nose of the hook, and means for locking the latch in its safety position, said locking means comprising a pawl, second spindle means pivotally mounting the pawl on the hook body, said second spindle means being perpendicular to the plane of the hook body, and said pawl being operative to retain the other nose of the latch to prevent the latter from pivoting, and resilient means biasing the pawl in a sense to hold it in a position in which it prevents the latch from pivoting.

4,294,480

SAFETY GUARDS AND METHODS FOR MANUALLY FEEDING WORKPIECES TO ASSEMBLY MACHINES

William S. Burns, Jr., and William M. Sankey, both of Shreveport, La., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 1, 1980, Ser. No. 117,687

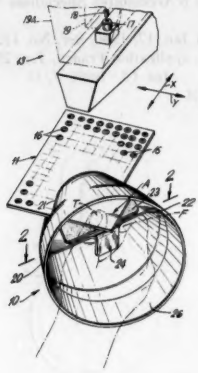
Int. Cl.[3] **B25D** *17/10;* **F16P** *1/00*

U.S. Cl. 294—131 **6 Claims**

1. A safety guard that permits manual gripping of an end portion of a workpiece to be fed to an assembly machine, which comprises:

a hollow shield having an opening at one end thereof into which an operator's hand can be inserted, the shield having a slot at the opposite end arranged for receiving the end portion of the workpiece within the shield, the shield further having means for supporting the end portion of the

workpiece within the shield and for permitting manual gripping of the end portion by the operator within the



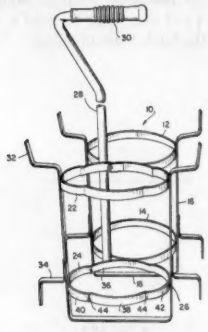
shield, while the shield precludes injury to the operator's hand when the workpiece is fed to the assembly machine.

4,294,481

GAS CYLINDER CARRIER

Douglas B. Pearl, Pompano Beach, Fla., assignor to Uniweld Products, Incorporated, Ft. Lauderdale, Fla.

Filed Jun. 26, 1980, Ser. No. 163,176
Int. Cl.³ B62B *1/14*
U.S. Cl. 294—146 **3 Claims**



1. In a gas cylinder stand or truck including cylinder support or base means, handle means and cylinder retaining means, improvements in said cylinder retaining means comprising:

first and second pairs of spaced, opposed arcurate sections;

said first pair of said sections being spaced and having a radius to accommodate and retain a gas cylinder of a given size therebetween;

said second pair of said sections being joined to said first pair at four junction points to form a unitary, cylinder-retaining structure;

said second pair of said sections having radii and an included angle or length to accommodate two adjacent gas cylinders of smaller size than said given size therebetween;

the radii of said second pair of said sections being smaller than the radius of said first pair of said sections.

4,294,482

RAILWAY WHEEL TREAD PROFILE

Herbert Scheffel; Rowlen E. von Gericke, and Joseph A. Viviers, all of Transvaal, South Africa, assignors to South African Inventions Development Corporation, Transvaal, South Africa

Filed Aug. 23, 1979, Ser. No. 69,515
Claims priority, application South Africa, Aug. 23, 1978, 78/4791
Int. Cl.³ B60B *17/00*
U.S. Cl. 295—34 **19 Claims**

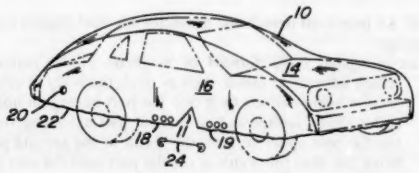
1. A profiled wheel-tread for a railway wheel having a circumferential running surface and a circumferential wheel flange with the running surface having a taping line and a running zone between the taping line and a radiussed fillet portion at the base of the wheel flange with the improvement that the effective conicity across the running zone, the effective conicity being dependent on the rate of change of rolling diameter, decreases progressively while remaining positive from a zone adjacent the taping line towards the wheel flange.

4,294,483

INFLATABLE VEHICLE COVER

Sean D. Ferris, 96 Spruce St., Natrona, Pa. 15065

Filed Mar. 14, 1980, Ser. No. 130,249
Int. Cl.³ B62D *25/00*
U.S. Cl. 296—136 **6 Claims**



1. A cover for protecting the body of a vehicle during transit against damage from the force of foreign objects directed at said vehicle body comprising:

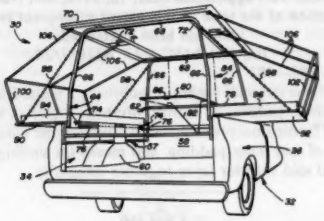
a body member defining at least one cell adapted for inflation by the introduction of a fluid into said cell;

a surface of said cell being shaped to conform to the contours of the outer surface of said vehicle body when said cell is inflated;

means for allowing introduction of said fluid into said cell to inflate said cell and for permitting release of said fluid from said cell to deflate said cell; and

means for securing said cell to said vehicle body to completely cover the exterior surface thereof.

4,294,484
VEHICLE CAMPER
Robert H. Robertson, Dallas, Tex., assignor to Ronbil Industries, Inc., Dallas, Tex.
Filed Mar. 9, 1979, Ser. No. 18,888
Int. Cl.³ B60P *3/32*
U.S. Cl. 296—156 **23 Claims**



10. A camper mounted on a vehicle having a vehicle bed, two sidewalls and a front wall, said camper comprising:

a top covering the vehicle bed and movable between a lowered position adjacent the upper edge of the two sidewalls and the front wall and a raised position elevated above the vehicle bed;

main frame means pivotally attached adjacent said sidewalls for supporting the rigid top in the raised position and for pivotally moving between a lowered frame position and a raised frame position;

lever means extending from said main frame means for applying a rotational force to said main frame means and comprising:

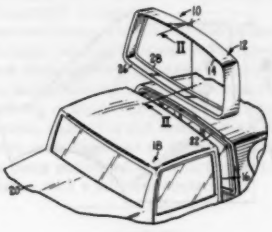
triangular plates extending from the lower end of said main frame means; and

catch means on said triangular plates disposed remotely from said main frame means for attaching said tension means to said triangular plates, whereby said tension means will impart a tension force to said triangular plates for applying a torque to said main frame means causing said main frame means to rotate toward the raised frame position; and

force means for applying a force to said lever means to apply a rotational force to said main frame means for urging said main frame means to rotate from the lowered frame position towards the raised frame position.

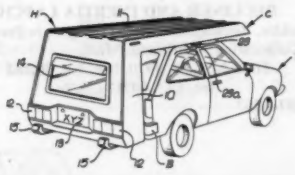
4,294,485
WINDOW BOOT
Thomas E. Engelhard, 4325 Colfax Ave. South, Minneapolis, Minn. 55409
Continuation-in-part of Ser. No. 921,276, Jul. 3, 1978, Pat. No. 4,222,605, which is a continuation-in-part of Ser. No. 738,313, Nov. 2, 1976, Pat. No. 4,114,943. This application Feb. 2, 1979, Ser. No. 8,539
Int. Cl.³ B60P *3/32*
U.S. Cl. 296—166 **7 Claims**

1. A combination including a boot and frame windows of a cab/camper assembly of the type having a rear frame window in the cab and a corresponding front frame window in the forward wall of the camper, said boot comprising a boot frame including a continuous resiliently deformable sidewall, said sidewall defining an aperture corresponding respectively to said windows in said cab and said camper, said sidewall terminating in respective opposite ends, one of said opposite ends including a thickened resilient continuous lip, said lip being adapted to be snap-fit into a corresponding window frame for thereby mounting said boot between said cab and camper, said window frame including an exteriorly extending substantially U-shaped channel in which the lip of said boot is grippingly receivable, the other of said ends including magnetic means for



securement of said boot to said cab, whereby said boot may be easily mounted and dismounted from said cab and camper.

4,294,486
CAMPER AND TENT UNIT
Eusebio H. Espejo, 1429 Alma St., San Pedro, Calif. 90731
Filed Dec. 21, 1978, Ser. No. 971,871
Int. Cl.³ B60P *3/34*
U.S. Cl. 296—167 **21 Claims**



1. A camper tent unit comprising a housing structure having a vertical section and a horizontal hollow shell section; means for supporting said housing structure on a passenger vehicle with said vertical section supported on the rear and said horizontal section extending forwardly on top of the vehicle; said horizontal shell section having a roof and front and side walls extending downwardly from said roof to form a storage space; flexible fabric tent components having means connecting the components to said front and side walls for folding storage in said shell and erectable to form with said housing structure, when removed from the vehicle, a laterally extended tent roof and side, front and rear tent walls connected with one another and with said housing structure to form an enclosure; and means providing frame structures connected with said roof and said front wall tent components to form rigid support therefore, when deployed from said housing structure.

4,294,487
CAR BODY
Yoshiharu Nakamura, Koganei, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan
Filed Aug. 20, 1979, Ser. No. 68,002
Claims priority, application Japan, Sep. 12, 1978, 53-125960[U]
Int. Cl.³ B62D *25/04*
U.S. Cl. 296—188 **3 Claims**

1. A car body of two-door type comprising:

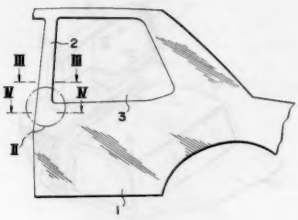
a center pillar provided on each side portion of the car body;

a rear fender integrated with the bottom of said center pillar;

a rear side glass elevatably provided along said center pillar; and

a stiffener having a front wall, a side wall and a rear wall which are formed of a channel shape in cross section so as to fit on the inside of said center pillar, said stiffener being

arranged within said center pillar, said stiffener extending downwards beyond the waist line of said rear fender, the



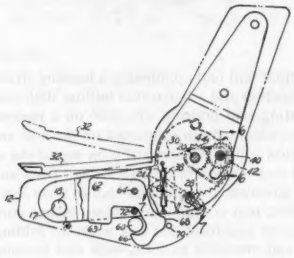
rear wall of said stiffener being fixed through a flange formed at an edge of said stiffener to an inner panel of said car body.

4,294,488

RECLINER AND INERTIA LATCH

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Southfield, Mich.

Filed Nov. 23, 1979, Ser. No. 96,883
Int. Cl.³ A47C *1/026*
U.S. Cl. 297—367 **13 Claims**



1. A vehicle seat construction comprising a vehicle seat having seat brackets fixed to opposite lateral ends thereof, a reclining seat back having recliner brackets fixed to opposite sides at the lower end thereof, pivot means interconnecting the seat brackets and the adjacent recliner brackets, lock means for positively locking both recliner brackets simultaneously in selected positions relative to said seat brackets, said lock means comprising a movable lock member at each side of the seat construction, a rotatably mounted actuator cooperating with each of said lock members, a manually movable lever fixed to one of said actuators, and a drive connection between said actuators to insure identical simultaneous movement of said actuators at opposite sides of said seat construction, said drive connection comprising an elongated straight, rigid torsion bar extending between and mounted for rotation about its longitudinal axis relative to a first pair of like brackets at opposite sides of the seat construction, and means providing for movement of said bar relative to the other pair of like brackets in an arcuate path concentric with but displaced substantially from the transverse pivot axis determined by the location of the pivot means interconnecting the brackets at opposite side of said seat construction.

4,294,489

UPHOLSTERED FURNITURE HAVING IMPROVED FLAME RESISTANCE

Colin Anolick; Vivian M. Robinson, both of Wilmington, and Charles W. Stewart, Sr., Newark, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 572,709, Apr. 29, 1975, Pat. No. 4,174,420. This application Mar. 13, 1978, Ser. No. 886,260
The portion of the term of this patent subsequent to Nov. 13, 1996, has been disclaimed.
Int. Cl.³ A47C *5/12;* B32B *3/26*
U.S. Cl. 297—452 **3 Claims**

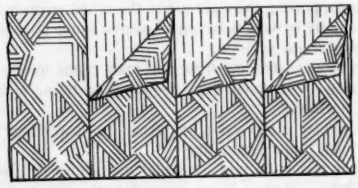
1. A flame resistant cushion comprising a metal frame assembly, an inner padding of foamed urethane material, an exterior layer of foamed neoprene material covering the entire exterior surface of said inner padding, and means for uniting said padding and said exterior layer together integrally.

4,294,490

FIBER-REINFORCED COMPOSITE WHEEL CONSTRUCTION

James A. Woelfel, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Feb. 6, 1980, Ser. No. 119,141
Int. Cl.³ B60B *21/00, 1/06*
U.S. Cl. 301—63 PW **26 Claims**



1. A composite wheel of fiber-reinforced resin comprising a disc wherein reinforcing fibers comprise fibers oriented randomly of the wheel axis and a rim wherein reinforcing fibers include first fibers oriented substantially randomly of the wheel axis and directional second fibers all extending in a direction essentially parallel to the wheel axis with the random and directional reinforcing fibers in said rim being disposed in essentially distinct layers radially of said wheel axis and with the fiber to resin weight ratio being in the range of 30% to 80%.

4,294,491

METAL DISK WHEEL WITH RESILIENT TREAD AND BEARING SUPPORT

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Continuation of Ser. No. 964,133, Nov. 27, 1978, abandoned. This application Apr. 30, 1980, Ser. No. 145,279
Int. Cl.³ B60B *1/06;* F16C *33/00*
U.S. Cl. 301—63 DD **5 Claims**

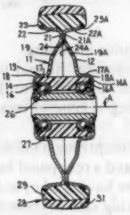
1. A wheel construction, comprising:

bearing means defining an axis of rotation, said bearing means being housed in an elastically deformable elastomeric sleeve;

a pair of identically shaped metallic stampings, each having a central cylindrical shell part axially aligned with the other and means defining a hole therethrough in approximately the center thereof, said stampings each having a surface portion intermediate said central cylindrical shell part and a first peripheral surface which is coextensive with a central plane through said wheel construction and perpendicular to said axis of rotation, said axially aligned cylindrical shell parts of each stamping housing said bear-

ing means therein with at least a portion of the inner surface of said cylindrical shell part engaging a portion of the external surface of said elastomeric sleeve adjacent the axial ends thereof and said surface portions slidingly engaging one another; and

an elastically deformable annulus of moldable synthetic resin material and means for fixedly securing said annulus to said first peripheral surface of said pair of metallic stampings to effect, along with said elastomeric sleeve engaging said inner surface of said cylindrical shell parts, a holding of said cylindrical shell parts and said surface portions in axial alignment, the material of said annulus and said sleeve having an elastically deformable characteristic to thereby permit said pair of stampings to temporarily shift radially relative to one another against the elastic resistance of said annulus and said sleeve arising due to an



elastic deformation of said annulus and said sleeve while maintaining said surface portions in sliding engagement with one another and to temporarily facilitate an orientation of said central plane inclined to said axis of rotation in response to shock loads having a component of force applied to said wheel construction in a direction parallel to said axis of rotation, said material further having a sufficient resistance to elastic deformation to thereby hold said metallic stamping in axial alignment during normal use thereof, said sleeve and said annulus thereby facilitating an absorption of said shock loads applied to said bearing means, said material further effecting a return of said pair of stampings to said axially aligned position thereof with said central plane oriented perpendicular to said axis of rotation following the termination of a shock load applied thereto.

4,294,492

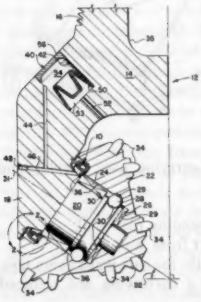
CALIPER SEAL ASSEMBLY

Robert F. Evans, 631 Honeywood La., La Habra, Calif. 90631

Continuation-in-part of Ser. No. 95,532, Nov. 19, 1979, Pat. No. 4,240,674. This application May 27, 1980, Ser. No. 153,540

Int. Cl.³ F16C *33/74*

U.S. Cl. 308—8.2 **20 Claims**



1. In combination with a drill bit, which includes a cutter wheel rotatably connected by a bearing assembly to a body element of the drill bit, a caliper seal assembly operatively extending between the cutter wheel and the bit body to seal the bearing assembly from the ambient environment of the bit, said caliper seal assembly comprising:

a first structure having a bifurcated end defined by a pair of flexible flank members separated by an intermediate channel, each flank member including a contact pad formed thereon facing into the intermediate channel; and

means defining a flange-like projection extending into the intermediate channel of said first structure, said flange-like projection including a pair of sealing surfaces, each sealing surface being positioned in contacting and movable sealing relation with a different contact pad.

4,294,493

MAGNETIC BEARING ASSEMBLY

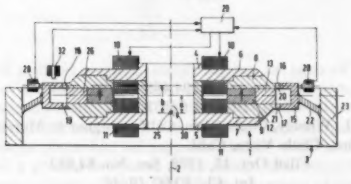
Rainer Sindlinger, Hirschberg, and Josef Hammer, Rotenberg, both of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Filed Nov. 2, 1979, Ser. No. 90,588

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847930

Int. Cl.³ F16C *39/06*

U.S. Cl. 308—10 **16 Claims**



1. In a magnetic bearing assembly for a rotor having an axis of rotation; the assembly including at least two actively regulated magnetic bearings for stabilizing the rotor in radial directions oriented substantially perpendicularly to one another and to said axis; said magnetic bearings defining a bearing plane oriented perpendicularly to said axis; means for sensing radial motions of said rotor and emitting first signals in response to said radial motions; and force generating means for applying to said rotor radial return forces as a function of said first signals; the improvement wherein said rotor has a center of gravity situated at an axial distance from said bearing plane whereby tilting motions of said rotor about tilt-axes perpendicular to said axis of rotation can be sensed; further comprising sensors for sensing said tilting motions of said rotor and emitting second signals in response to said tilting motions; said sensors being situated at an axial distance from said bearing plane; said force generating means applying to said rotor, as a function of said second signals, return forces opposing said tilting motions of said rotor.

4,294,494

SLIDING-TYPE BEARING

Masahiro Yoshioka; Toshifumi Koike, both of Ibaraki, and Hideki Izumi, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 27, 1979, Ser. No. 97,698

Claims priority, application Japan, Dec. 4, 1978, 53-149117

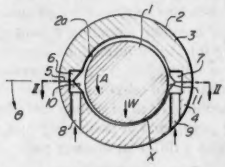
Int. Cl.³ F16C *1/24*

U.S. Cl. 308—76 **6 Claims**

1. In a sliding-type bearing having a bearing surface provided with a lubricating oil groove at each of two portions thereof substantially 90° apart from the point to which the load of a rotary shaft is applied,

an improvement which comprises: a chamfer formed in at least the portion of the bearing surface near one of the

lubricating oil groove remoter from the point of the minimum bearing clearance determined by the direction of rotation of the shaft and by the direction of application of the load, said chamfer being communicated with said one



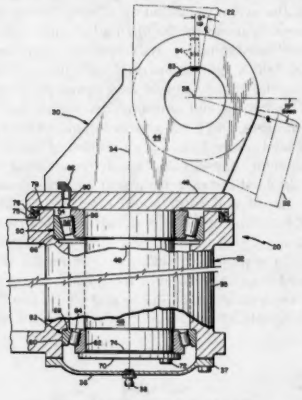
of said lubricating oil groove and opening at the side of said bearing, said chamfer being adapted to permit the discharge of the heated lubrication oil to the outside of said bearing together with the cooled lubricating oil supplied to said one of said lubricating oil grooves.

4,294,495

BOOM SOCKETS

Morris L. Whaley, Chula Vista, Calif., assignor to Morris Whaley, Inc., Chula Vista, Calif.

Filed Oct. 15, 1979, Ser. No. 84,852
Int. Cl.[3] **F16C** *19/36*
U.S. Cl. 308—174 **14 Claims**



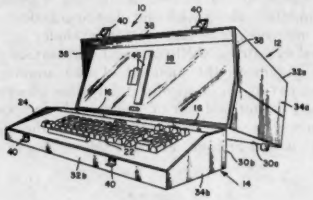
1. A boom socket or the like, comprising: a housing; a gooseneck assembly comprising a vertical pin and a gooseneck at the upper end thereof; means comprising vertically spaced, upper and lower tapered roller bearings rotatably supporting said vertical pin in said housing for rotation about a vertical axis; a boom end; and means for rotatably supporting said boom end for rotation about a horizontal axis from said gooseneck comprising a cross pin extending through said gooseneck, boom end brackets embracing said gooseneck, and tapered roller bearings surrounding the respective end of said cross pin for rotatably supporting said boom end brackets from the respective ends of said cross pin.

4,294,496

PORTABLE COMPUTER ENCLOSURE

James D. Murez, Santa Monica, Calif., assignor to GM Research, Carson, Calif.

Filed Aug. 3, 1979, Ser. No. 63,418
Int. Cl.[3] **A47B** *21/00*; **A47R** *81/00*; **H05K** *5/00*
U.S. Cl. 312—208 **4 Claims**



1. A portable computer including:
first and second enclosures hinged together at ends which are closeable upon each other to define a single suitcase-type cabinet having a general rectangular parallelepiped configuration;
said first enclosure comprising a main frame with a display at its closeable end, and a rear panel backing said main frame;
said second enclosure having a keyboard at its closeable end, a front panel backing said keyboard, and a handle extending from said front panel;
said enclosures further having top and bottom panels respectively segmented into first and second portions respectively on said first and second enclosures;
hinges connecting said first and second portions of said segmented bottom panel;
cooperating latches respectively on said first and second portions of said segmented top panel for securing said enclosures together when closed; and
foot pads extending from said rear panel, said first portion and said front panel.

4,294,497

COMBINED CARRYING CASE, DISPLAY DEVICE AND LECTERN

Robert A. Daniel, 455 Center St., Bridgewater, Mass. 02324

Filed Aug. 14, 1980, Ser. No. 178,085
Int. Cl.[3] **A47B** *27/00*
U.S. Cl. 312—231 **5 Claims**

1. A multi-use carrying case, display and lectern device comprising:
a bottom wall;
an upwardly extending rear wall;
a relatively short front wall;
a pair of side walls, the side walls being tapered upwardly so as to present a narrowing and reduced width at their upper ends;
said walls being secured together to define a case configuration which, in cross section, tapers upwardly;

a rectangular cover extending downwardly along the front edge of each of the side walls and being arranged to cover fully the case, the cover being hinged at its upper end to the upper end of the rear wall;

a transversely extending slot formed in the short front wall;

a shelf defining a false bottom within the case, the shelf being extendable through the slot to provide a forwardly extending shelf on which materials may be supported;

guide means for guiding and supporting the shelf for movement between its retracted configuration in which it defines the false bottom for the case and its extended configuration in which it projects outwardly through the slot; and

a carrying handle secured to the upper region of the device.

4,294,498

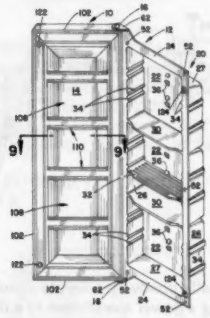
WALL CABINET AND METHOD OF MAKING

Richard D. Van Luit, 189 Manning Dr., Berea, Ohio 44017

Filed Oct. 17, 1979, Ser. No. 85,691

Int. Cl.[3] A47B *67/02;* **A47F** *5/08;* **E05D** *7/00*

U.S. Cl. 312—245 **7 Claims**



1. A plastic wall cabinet comprising a body portion of plastic sheet material and having a back wall and top, bottom and side walls integral with and extending forwardly of said back wall to provide said body portion with an open front, mounting flange means including upper and lower planar mounting flanges integral with and extending upwardly and downwardly respectively from said top and bottom walls, said upper and lower mounting flanges having upwardly and downwardly facing terminal edges, respectively, extending laterally between said side walls, said planar mounting flanges having corresponding first ends adjacent one of said side walls, upper and lower hinge leaf means each integral with the corresponding one of said upper and lower terminal edges of said first ends of said mounting flanges, each said hinge leaf means including a laterally narrow planar hinge leaf vertically spaced from the corresponding one of said top and bottom walls and extending horizontally forwardly of the corresponding mounting flange, a hollow door for closing said open front, said hollow door comprising front and back panels of plastic sheet material bonded together to provide a central portion bounded by a peripherally continuous hollow portion including a seam between said panel sheets extending about said hollow portion and rearwardly from said front panel toward said back panel, said panel sheets in the area of said seam having rearwardly facing terminal end edges transverse to said seam, and a hinge pin extending through each said hinge leaf and into said hollow portion of said door to pivotally mount said door on said body portion.

4,294,499

PULL-OUT GUIDE ASSEMBLY

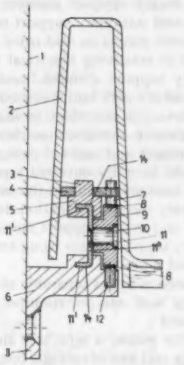
Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Jun. 4, 1979, Ser. No. 45,264

Claims priority, application Austria, Jun. 6, 1978, 4097/78

Int. Cl.[3] A47B *88/04, 88/14, 88/16*

U.S. Cl. 312—334 **9 Claims**



1. A pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein a drawer is slidably insertable into and removable from a furniture body, said pull-out guide assembly comprising:

separate plural first rail supports adapted to be fixed to a side of a drawer in spaced relationship with respect to each other along a direction of sliding movement of the drawer;

separate plural second rail supports adapted to be fixed to a side of a furniture body in spaced relationship with respect to each other along said direction;

a single rail directly supported by said plural first rail supports and by said plural second rail supports for relative sliding movement therebetween in said direction;

an endless belt mounted on said rail for movement in said direction; and

connecting means for fixing said endless belt to the drawer and to the furniture body, such that movement of the drawer in said direction will pull said endless belt in said direction and cause said rail to slide with respect to said plural first and second rail supports.

4,294,500

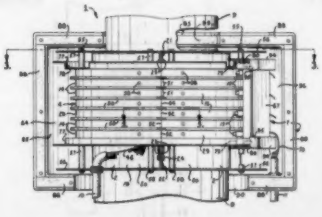
ROTARY ELECTRICAL JUNCTION ASSEMBLY

Jack A. Wilson, 502 N. Santa Fe, Salina, Kans. 67401

Filed Aug. 30, 1979, Ser. No. 71,191

Int. Cl.[3] H01R *39/08, 39/14*

U.S. Cl. 339—5 M **13 Claims**



1. A rotary electrical junction device comprising:

(a) stator means formed in at least two stator sections;

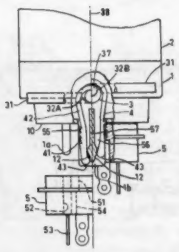
(b) means securing said stator sections around a stationary support member for selective mutual separation of said stator sections laterally outward from said stationary support member;
(c) stator contact means on said stator means and electrically connected to stationary electrical means;
(d) rotor means formed in at least two rotor sections;
(e) means securing said rotor sections around a rotary support member for selective mutual separation of said rotor sections laterally outward from said rotary support member, said rotary support member being rotatably connected to said stationary support member;
(f) rotor contact means on said rotor means and electrically connected to revolving electrical means associated with said rotary support member, said rotor contact means being in contact with said stator contact means when said junction device is assembled to thereby provide continuous electrical communication between said stationary electrical means and said revolving electrical means, and whereby the laterally outward separability of said stator and rotor sections facilitates the installation and removal of said rotary electrical junction device on and from said stationary and rotary support members;
(g) said rotary support means being rotatable about an axis of rotation and wherein:
(1) said stator means is separable along a stator split plane including said axis of rotation into a pair of stator halves; and
(2) said rotor means is separable along a rotor split plane including said axis of rotation into a pair of rotor halves;
(h) said stator contact means being a plurality of slip rings, each of said slip rings being separable into a pair of slip ring halves;
(i) said rotor contact means being a plurality of brushes, each brush being associated with a respective slip ring;
(j) said brushes mounted in side-by-side relation on at least one brush rack;
(k) annular guide means provided on each of said stator halves to receive said brush rack thereon with said brushes conductively engaging respective slip rings such that said brush rack may be revolved about said stator means; and
(l) said rotor means including a split construction housing enclosing said stator means and said brush rack, said housing being mounted on said rotary support member and including brush rack engaging means whereby said brush rack is revolved about said stator means upon rotation of said housing.

4,294,501

PLUG MEMBER FOR THE ELECTRICAL CONNECTION OF AN APPLIANCE TO A BASE

Edouard Jouret, Bresso-Milano, Italy, assignor to Crouzet, Paris, France

Filed Nov. 26, 1979, Ser. No. 97,428
Claims priority, application France, Dec. 1, 1978, 78 34162
Int. Cl.³ H01R *13/639*
U.S. Cl. 339—66 M **4 Claims**



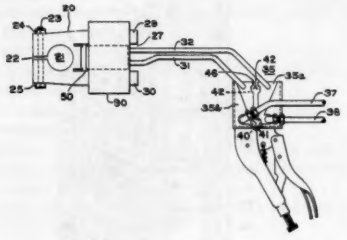
1. In an electrical connector including a plug member and a base having conducting pins extending from the plug to be introduced into metal-sheathed holes in the base for electrically connecting the plug to the base, a centering stud adapted to be introduced in a centering hole in the base, and locking means for locking the plug member on the base, the improvement wherein the locking means comprises a hollow recess in said stud, at least two lateral openings through said stud between said recess and the outer surface of said stud, a U-shaped locking member mounted within said recess for sliding movement with respect to said stud between a locking and a release position, means in said recess for spreading apart the arms of the U-shaped locking member as it moves from said release to said locking position so that said arms project from the centering stud through said lateral openings to engage the wall of the centering hole in the base, and means on said plug to move said locking member between said release and locking positions.

4,294,502

BUSHING TERMINAL AND BUSS BAR

Walter L. Martin, Jr., Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 4, 1979, Ser. No. 72,702
Int. Cl.³ H01R *13/00*
U.S. Cl. 339—112 L **6 Claims**



1. An electrically conductive supply connector suitable for use in connecting a power transformer to a fiber glass forming bushing comprising a bushing terminal connector having an electrically conductive body provided with a slot adapted to receive the electrical supply terminal of a fiber glass bushing, means to circulate cooling fluid through said body, means to connect at least two tubular bus bars to said body, a metal block on the opposite the ends of said bus bars provided internally with a cooling fluid passage and in communication with the bus bars so that fluid can be circulated from said body through one of said bus bars and said block and back to said body, a transformer terminal connector having a solid electrically conductive core provided with two arm like extensions forming a recess therein and adapted to receive said body, means to clamp said body in said recess and form an electrical connection between said extension and said body and means in said core to connect said core to the secondary of a power transformer.

4,294,503

LOCKING MEANS FOR A LAMP HOLDER

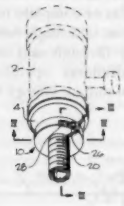
Gilbert R. Lieberman, Hampstead, Canada, assignor to Gilbert Products, Pointe-aux-Trembles, Canada

Filed Jan. 11, 1980, Ser. No. 111,372
Claims priority, application Canada, Dec. 7, 1979, 341477
Int. Cl.³ H01R *13/629*
U.S. Cl. 339—119 L **13 Claims**

1. A locking arrangement for a lamp holder which has a threaded opening to receive a threaded component and having an axis, the locking device comprising:
a locking member captively carried by the lamp holder and

which is mounted for limited movement in a direction normal to the axis of the threaded opening,

the locking member having opposed inwardly facing edges for contact with a threaded component into the lamp holder,



the lamp holder comprising a body portion and a cap portion, the locking member being positioned in a cavity provided in the cap portion and held captively therein by a retaining cap, and

the locking member permitting threaded insertion of the threaded component and preventing inadvertent threaded removal.

4,294,504

HIGH VOLTAGE CABLE

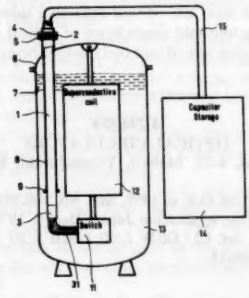
Lothar Siewerdt, Eggenstein-Leopoldshafen, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jul. 13, 1979, Ser. No. 57,373

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830736

Int. Cl.³ H01R *15/12*; H01B *11/18*

U.S. Cl. 339—132 R **7 Claims**



2. A high voltage cable and support therefor for transmitting current pulses up to 10 kiloamperes at temperatures in the range from 4° K. to 300° K.,

said cable comprising at least one conductive element including:

a flexible inner conductor;

an insulating sheath surrounding said inner conductor, said inner conductor moving freely within said insulating sheath;

a flexible outer conductor encasing said insulating sheath, the cross-sectional area of said outer conductor being relatively small compared to that of said inner conductor, said inner and outer conductors being electrically conductively connected together; and

an insulating jacket encasing said outer conductor and insulating sheath without the formation of gas bubbles within said insulating jacket; and

said support structure comprising a plug-in coupling including:

a cast resin block having a plurality of said conductive elements encased therein;

a soldering sleeve having a threaded opening therein positioned within the bore in said block, said inner conductor being soldered within the opening of said soldering sleeve and said insulating jacket surrounding said sleeve;

an annular flange enclosing said block; and

a contact pin threaded into the opening of said soldering sleeve.

4,294,505

TERMINAL CONNECTOR FOR AN ELECTRIC STORAGE BATTERY

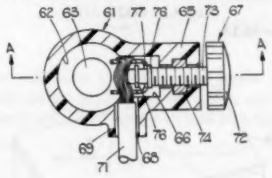
Edward N. Gaffney, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 3, 1979, Ser. No. 35,766

Claims priority, application United Kingdom, May 12, 1978, 19141/78

Int. Cl.³ H01R *11/26*

U.S. Cl. 339—231 **7 Claims**



1. A terminal connector for an electric storage battery comprising a body having a bore therein arranged to receive a terminal post, an electric cable, a conductive element to which the electric cable is secured with the cable being presented to said bore, and an operating member movable relative to the body and said conductive element and carrying said conductive element, the operating member being movable relative to the body, while the body remains stationary, to move the conductive element and the electrical cable relative to said bore whereby the electrical cable can be moved into and out of electrical contact with a terminal post received in said bore in use.

4,294,506

OPTICAL SCANNER WITH ANAMORPHIC OPTICAL SYSTEM

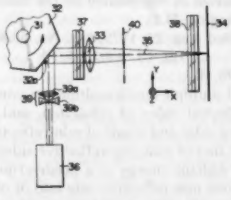
Nobuoto Hattori, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Dec. 15, 1978, Ser. No. 969,849

Claims priority, application Japan, Dec. 26, 1977, 52/156954

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.8 **8 Claims**



1. An optical scanner comprising a laser unit for producing a collimated light beam, a multi-faceted rotating mirror for

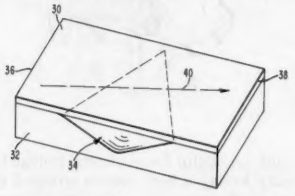
receiving said collimated light beam and reflecting it to a scanning surface, an anamorphic optical system disposed between said rotating mirror and said scanning surface for focussing said beam on the latter surface in a scan direction and for focussing said beam on a plane located short of said scanning surface in a direction perpendicular to said scan direction, said anamorphic optical system comprising a first lens which has a focussing power only in a direction perpendicular to said scan direction and a second lens, said first and second lenses disposed between said rotating mirror and said plane for focussing said beam on said plane at a location short of said scanning surface, and an optical element disposed between said plane and said scanning surface and having a focussing power only in a direction perpendicular to said scan direction and having a magnification of projection which is equal to or less than unity, said optical element projecting said beam which is focussed on said plane onto said scanning surface to focus said beam thereon.

4,294,507

CONTROLLABLY DEFORMED ELASTIC WAVEGUIDE ELEMENTS

Mark Johnson, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 25, 1980, Ser. No. 115,477
Int. Cl.[3] G02B *5/14*
U.S. Cl. 350—96.13 **41 Claims**



1. An active waveguide element, comprising:

an elastic two dimensionally guiding waveguide for propagating wave energy therethrough along a first path, said wave energy having immediately adjacent rays each experiencing the same effective propagation path lengths; and

means for stretchably deforming said waveguide to a different configuration such that said adjacent rays would experience effective propagation path lengths different from each other if said wave energy were to still propagate along said first path, said wave energy propagating instead along a second different path through said waveguide when said waveguide is stretchably deformed to said different configuration such that said adjacent rays each experience the same effective propagation path length also when said wave propagates along said second path.

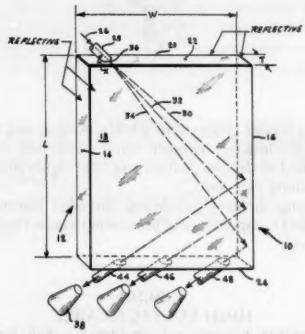
4,294,508

OPTICAL MULTIPLEXER/DEMULTIPLEXER

Charles R. Husbands, Acton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 22, 1979, Ser. No. 68,822
Int. Cl.[3] G02B *5/14*
U.S. Cl. 350—96.15 **17 Claims**

1. An optical multiplexer/demultiplexer comprising a body having a preselected index of refraction, said body having a pair of reflective sides and a pair of non-reflective sides, means associated with one of said non-reflective sides for directing a single beam of radiant energy at a predetermined angle with respect to said one non-reflective side into or out of said body, said single beam of radiant energy containing at least two preselected wavelengths, means associated with the other of said non-reflective sides for directing at least two beams of radiant energy, each at predetermined angles with respect to said other non-reflective side into or out of said body, each of said two beams of radiant energy containing only one of said preselected wavelengths, respectively, said two beams of radiant energy being spaced apart a preselected distance along said other non-reflective side, and each of said predetermined angles lying between angles of complete refraction and complete reflection, whereby when said single beam of radiant energy is directed into said body through said one non-reflective side, said multiplexer/demultiplexer operates as a demultiplexer with said single beam of radiant energy being separated within



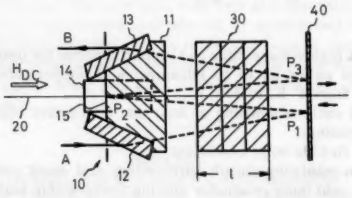
said body into said two beams of radiant energy, each of said two beams containing only one of said preselected wavelengths, respectively, said two beams reflecting off at least one of said reflective sides of said body before being output from said other non-reflective side, and when said two beams of radiant energy are directed into said body through said other non-reflective side, said multiplexer/demultiplexer operates as a multiplexer with said two beams of radiant energy being reflected off at least one of said reflective sides of said body and combining into said single beam of radiant energy at said one non-reflective side of said body before being output therefrom.

4,294,509

OPTICAL CIRCULATORS

Tsukasa Nagao, 4-75, Mabori, Yokosuka-shi, Kanagawa-ken, Japan

Filed Dec. 6, 1979, Ser. No. 100,893
Claims priority, application Japan, Dec. 8, 1978, 53-152308
Int. Cl.[3] G02F *1/00*; G02B *5/30*
U.S. Cl. 350—96.15 **27 Claims**



1. An optical circulator comprising:

a plurality of optical fiber transmission lines for guiding a signal light,

a magneto-optic structure made of magneto-optic material displaying optical anisotropy under a biasing magnetic field to produce a given Faraday rotation of said signal light on passage through said magneto-optic structure,

a signal coupler having a plurality of openings which define polarized Brewster windows formed on a common region in rotational symmetry around a symmetric axis, said transmission lines being coupled to the windows of the common region in rotational symmetry around the symmetric axis to transmit said signal light through said windows with respectively given angles of polarization,

a first reflecting mirror formed on said common region except said openings of said signal coupler, said first mirror being positioned on said symmetric axis facing said magnetro-optic structure,

a second reflecting mirror being positioned facing the rear surface of said magneto-optic structure, thereby said reflecting mirrors forming a reflection-type resonator,

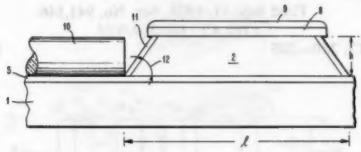
and means for magnetically biasing said magneto-optic structure in the direction parallel to said symmetric axis.

4,294,510

SEMICONDUCTOR FIBER OPTICAL DETECTION

Terry I. Chappell, Amawalk, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1979, Ser. No. 101,960
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.17 **8 Claims**



1. A coupler for converting light signals transmitted by an optical fiber to electrical signals wherein the optical path in said coupler is longer than the length dimension of said coupler comprising in combination:

a coupler body of semiconductor material having a length dimension governed by the optical absorption coefficient of said semiconductor material and the wave length of said light signals and having width and height dimensions less than said length dimension;

a region of p conductivity type along a first side of said body essentially parallel to said length dimension and having an external electrical connection;

a region of n conductivity type along a second side of said body opposite to said first side and having an external electrical connection;

internal reflection means on each of the remaining sides of said body that are essentially parallel to said length dimension; and

alignment means positioning the end of an optical fiber adjacent one end of said body with the axis of said optical fiber parallel with said length dimension of said body.

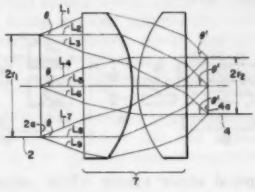
4,294,511

CONNECTING OPTICAL SYSTEM FOR LIGHT GUIDES

Nobuo Yamashita, Tama, and Miwako Maeda, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1979, Ser. No. 55,035
Claims priority, application Japan, Jul. 10, 1978, 53-83825
Int. Cl.³ G02B 5/16
U.S. Cl. 350—96.18 **1 Claim**

1. An optical system for connecting light guides for endoscopes comprising a first light guide which is arranged on the side of the light source and functions to transmit rays from said light source, a second light guide which receives the rays transmitted through said first light guide and which emerge from the emerging end surface thereof, transmits said rays and allows said rays to emerge from the emerging end surface of said second light guides for illuminating an object, and a lens system arranged between said first and second light guides; the emerging end surface of said first light guide being arranged in the vicinity of the front focal point of said lens system, the incidence end surface of said second light guide being arranged



in the vicinity of the rear focal point of said lens system with the diameter of the end surface of said first light guide being larger than that of the incidence end surface of said second light guide; and said optical system being so designed as to satisfy the following condition:

$$\frac{2r_1}{f} \geqq 1$$

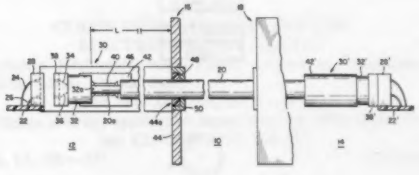
wherein the reference symbol r_1 represents radius of the emerging end surface of said first light guide and the reference symbol F designates focal length of said lens system.

4,294,512

OPTOELECTRONIC INTERFACE APPARATUS

Maurus C. Logan, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Jan. 14, 1980, Ser. No. 111,943
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.20 **11 Claims**

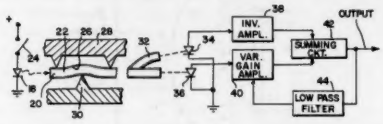


1. Optoelectronic apparatus comprising a housing having an upstanding wall defining an entry aperture, said housing supporting a first disconnect electrical contact distal from said wall and interiorly of said entry aperture, and a fiber optic assembly including a fiber optic cable, transducer means for conversion between light and electrical energy in registry with said cable, a second disconnect electrical contact coupled to said transducer means and configured to couple to said first disconnect electrical contact, and ferrule means for securing said cable and said transducer means to one another, said fiber optic assembly being of cross-section less than the cross-section of said entry aperture, whereby said fiber optic assembly is insertable through said entry aperture and said second disconnect contact may be coupled to said first disconnect contact within said housing remotely from said entry aperture.

4,294,513
OPTICAL SENSOR SYSTEM

David E. Nelson, and John V. Bouyoucos, both of Rochester, N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.

Filed Sep. 11, 1979, Ser. No. 74,270
Int. Cl.[3] G02B 5/172
U.S. Cl. 350—96.29 29 Claims

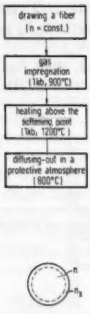


1. An optical sensor system which comprises an optical waveguide, first and second means each for detecting light which is propagated along different paths in said waveguide to reach said detection means, means for deforming said waveguide to provide a bias deformation which, on the average, approximately equally partitions the light energy which propagates to said detecting means along said different paths, and to modulate the partitioning of light energy between said paths in response to the parameter to be sensed, and means for providing an electrical output corresponding to the difference between light energies detected by said first and second detection means.

4,294,514
LIGHT-WAVE GUIDES AND METHOD OF PRODUCING SAME

Hartmut Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 73,724
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843276
Int. Cl.[3] G02B 5/14; C03B 37/00
U.S. Cl. 350—96.31 5 Claims


drawing a fiber (n = const.)
gas impregnation (1kb, 900°C)
heating above the softening point (1kb, 1200°C)
diffusing-out in a protective atmosphere (800°C)
n
n₂

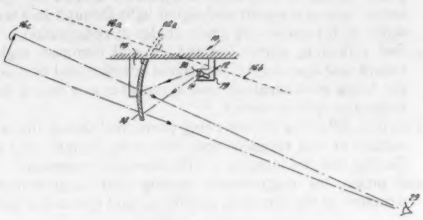
5. A low loss light-wave guide comprising a fiber composed of a substantially chemically homogeneous material having a given density along the center axis thereof and a density lower than said given density at peripheral surface areas thereof whereby such fiber exhibits a radially outwardly decreasing refractive index.

4,294,515
VIRTUAL IMAGE DISPLAY APPARATUS

Arthur Kaufman, 19 Covlee Dr., Westport, Conn. 06880

Filed Mar. 23, 1979, Ser. No. 23,160
Int. Cl.[3] G02B 27/14, 5/10
U.S. Cl. 350—174 18 Claims

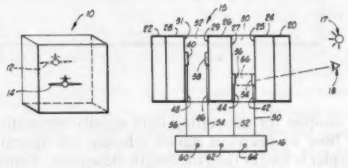
1. A virtual image display apparatus comprising a mirror in the shape of a substantially concave segment of a hemisphere said spherical mirror having an optical axis and a focus, an image source means for said mirror segment, and an image display face on said image source disposed substantially perpendicular to said optical axis but located off said axis and substantially on the same side of the axis as the line of sight of an observer and between said focus and said mirror segment.



4,294,516
MOVING PICTURE APPARATUS

Philip A. Brooks, 436 NW. 46th Terrace, Oklahoma City, Okla. 73118

Filed Sep. 11, 1978, Ser. No. 941,146
Int. Cl.[3] G02F 1/133
U.S. Cl. 350—335 1 Claim



1. An apparatus for creating the effect upon a viewer of a three-dimensional moving image, comprising:

a display structure including a stacked array of a plurality of transparent members and liquid crystal members alternatingly positioned so that said stacked array has a first end thereof defined by a respective one of the transparent members and a second end thereof defined by another respective one of the transparent members and said stacked array also has a liquid crystal member disposed between consecutive transparent members whereby there are a plurality of sets of facing surfaces of consecutively stacked transparent members, each set being disposed adjacent the two major surfaces of a respective one of the liquid crystal members;

a plurality of pairs of image producers associated with said display structure, each pair of said image producers comprising solely:

a first transparent electrode having a predetermined shape in the configuration of a total pictoral image to be displayed, said first transparent electrode being disposed on a respective one of the facing surfaces of a respective one of the sets of facing surfaces; and

a second transparent electrode having a predetermined shape which is the mirror image of the predetermined shape of said first transparent electrode, said second transparent electrode being disposed in alignment with said first transparent electrode on the other facing surface of the respective set of facing surfaces with which said first transparent electrode is associated; and

a scanning controller means, electrically connected to said plurality of pairs of image producers, for sequentially activating at a selectable rate said image producers so that each set of first and second transparent electrodes be-

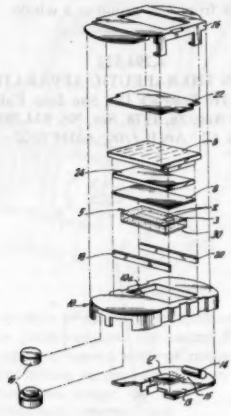
comes periodically visible to the viewer so that the effect of motion is imparted thereto.

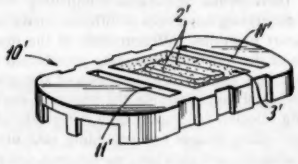
4,294,517

ELECTROOPTICAL DEVICE WITH ENCAPSULATED SELF-LUMINOUS BACKLIGHT ASSEMBLY

John Jakubek, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed May 14, 1979, Ser. No. 39,095
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—345 **10 Claims**





1. An illuminated electrooptical device, comprising:
(a) an electrooptic display;
(b) a unitary pod member-backlight assembly comprising,
(1) a pod member located behind and supporting the display, said pod member including a receptacle in a surface facing the display, and
(2) a backlight comprising at least one self-luminous light source encapsulated in situ within a substantially transparent carrier medium in the receptacle with the receptacle acting as a mold during encapsulation.

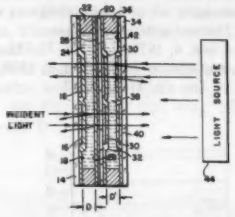
4,294,518

DUAL MODE LIGHT VALVE DISPLAY

James M. O'Connor, Farmington, and George W. Goodrich, Bloomfield Hills, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Nov. 30, 1978, Ser. No. 965,117
Int. Cl.³ G02F *1/17*
U.S. Cl. 350—357 **18 Claims**

1. A dual mode display comprising:
a front transparent window having a front and a rear surface, said rear surface having a first set of transparent electrically conductive electrodes arranged in a predetermined pattern disposed thereon;
a rear transparent window disposed parallel to said, front window said rear window having a front surface and a rear surface, the front surface of said rear window further having deposited thereon a second set of electrically conductive transparent electrodes corresponding to said first set of electrically conductive transparent electrodes and in registration therewith;
a semi-transparent reflective substrate disposed intermediate said front and rear windows and parallel thereto, said semi-transparent reflective substrate having an electrically conductive front surface facing said front window, and a rear surface facing said rear window, the rear surface of said semi-transparent substrate having disposed thereon a third set of transparent electrodes corresponding to said first set of transparent electrodes and in registration therewith;
a first layer of electro-responsive material filling the space between said front window and said semi-transparent substrate, said first layer of electro-responsive material



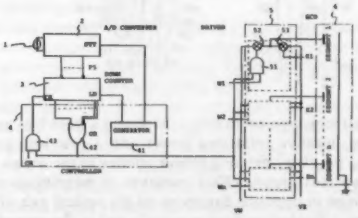
having a first optical density in the absence of an electrostatic field, and a second optical density in response to an electrostatic field applied there across;
a second layer of electro-responsive material filling the space between said semi-transparent substrate and said rear window, said second layer of electro-responsive material having a third optical density in the absence of an electrostatic field and a fourth optical density in response to an electrostatic field applied thereacross;
means for sealing said front window, said semi-transparent substrate and said rear window in said parallel relationship; and
means for individually conducting electrical potentials to said first, second and third sets of electrically conductive transparent electrodes and the electrically conductive front surface of said semi-transparent reflective substrate.

4,294,519

COLOR DENSITY STABILIZER FOR ELECTROCHROMIC DISPLAY

Sadakatsu Hashimoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1979, Ser. No. 41,637
Claims priority, application Japan, May 26, 1978, 53-64173
Int. Cl.³ G02F *1/17*; 350 *357*
U.S. Cl. 350—357 **9 Claims**



1. A driving circuit for developing driving signals to drive an electro-optical device, said device including an optical

element, said element being colored in response to said driving signals, the coloration of said element depending on the surrounding temperature, said driving circuit comprising:

monitoring means for monitoring variations in the surrounding temperature; and

controlling means responsive to the monitoring means for controlling the time interval of application of the driving signals being applied to the electro-optical device in accordance with the variations in the surrounding temperature monitored by the monitoring means; whereby a single, uniform depth of color of the optical element is maintained regardless of the variations in the surrounding temperature monitored by the monitoring means.

4,294,520

ELECTROCHROMIC DISPLAY DEVICE

Eiichi Inoue, Tokyo; Isamu Shimizu, Yokohama, and Makoto Shizukuishi, Kamakura, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigarah, Japan

Filed Sep. 6, 1979, Ser. No. 73,032

Claims priority, application Japan, Sep. 6, 1978, 53-110171

Int. Cl.[3] G02F *1/17*

U.S. Cl. 350—357 **12 Claims**

1. An electrochromic display device comprising a transparent electrode, a laminate structure provided on said electrode comprising a vapor deposited layer of an electrochromic substance and a second vapor deposited mixed layer of chromium (III) oxide and an oxide selected from the group consisting of a transition metal oxide and silicon oxide and a counter electrode provided on said laminated structure wherein said oxide is present in an amount of 5 to 80% of said second vapor deposited mixed layer.

4,294,521

REAR STOP TYPE ZOOM LENS

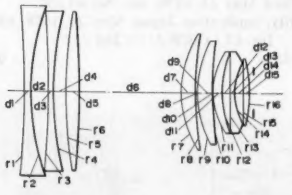
Yoshikazu Doi; Yutaka Sakai, and Kazunori Ohno, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Japan

Filed Aug. 30, 1979, Ser. No. 71,042

Claims priority, application Japan, Sep. 1, 1978, 53-107735

Int. Cl.[3] G02B *15/16*

U.S. Cl. 350—426 **2 Claims**



1. A rear stop type zoom lens, comprising a front lens group possessing negative refracting power and a rear lens group possessing positive refracting power relative to the object side which two lens groups effect variation in magnification by being moved in opposite directions on the optical axis of the entire lens, a diaphragm fixed externally and to the rear of the rear lens group, the front lens group consisting of two biconcave lenses and one convex lens and the rear lens group consisting of five lenses, the first three in order being convex meniscus lenses each having its convex surface on the object side, and satisfying the following conditions:

(1) $-2.4<F_A<-2.0$

(2) $0.13<d11+d12+d13<0.19$

(3) $\nu d3<30.0$, $\nu d8<30.0$

(4) $0.35<1/r4<0.55$

(5) $1.7<1/r9<1.9$

wherein, r_i ($i=1, 2, \ldots$) stands for the radius of curvature of the lens surface of the respective lenses beginning from the foremost surface of the front lens group, d_i for the center thickness of the lenses or the air gaps between the adjacent lenses, νd_i for the Abbe number of the lenses, and F_A for the focal length of the front lens group as a whole.

4,294,522

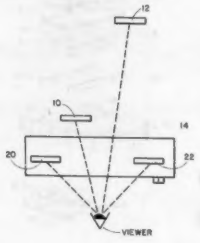
VISION THERAPEUTIC APPARATUS

John T. Jacobs, 1318 Rimrock Dr., San Jose, Calif. 95120

Filed Aug. 16, 1978, Ser. No. 934,381

Int. Cl.[3] A61B *3/00*; A61H *1/02*

U.S. Cl. 351—2 **6 Claims**



1. Vision thereapeutic apparatus comprising means for automtically generating sequences of different images at different spaced apart locations, different ones of the images displayed at one of the locations providing preselected information when matched with preselected ones of the images displayed at another of said locations, the images at each of said locations being selected for display on a non-predictable basis among various other images not providing said preselected information, whereby said matching occurs on a non-predictable basis, and means for detecting responses from the user indicative of his observations of said images.

4,294,523

THREE-DIMENSIONAL DISPLAY APPARATUS

Edward A. Woloshuk; Gregory J. Walz, both of New York, and Robert O. Kretzschmar, Brooklyn, all of N.Y., assignors to The Zyntrax Corporation, New York, N.Y.

Filed Oct. 19, 1979, Ser. No. 86,393

Int. Cl.[3] G03B *21/32*

U.S. Cl. 352—86 **20 Claims**

1. Apparatus for forming and displaying a three-dimensional image of a selectable portion of a three-dimensional object, comprising:

a. a series of two-dimensional photographs of successive sections of said object, said photographs being arranged in a predetermined order corresponding to the relationship that said successive sections bear to each other;

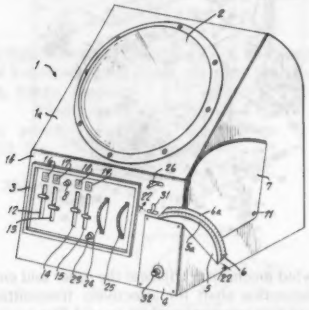
b. illuminating means;

c. an optical system defining an optical path extending from said illuminating means;

d. means supporting said series of photographs and operable to move said series of photographs repeatedly through said optical path in said predetermined order and at a rate such that the series moves through the path within the period of persistence of vision, whereby said photographs are successively positioned for projection along said path;

e. stroboscopic means for flashing said illuminating means as a photograph is aligned with said path;

f. a projection screen disposed in said optical path and adapted to move along the optical path toward and away from the photographs moving through the optical path, said projection screen having its surface formed with a curved cross-section and being rotatable about an axis displaced from the center of curvature of the cross-section, which axis is disposed substantially at right angles to the optical path, said rotation being in synchronization



with the motion of said photographs so that said photographs are projected onto the screen at successive positions thereof, and form a series of images which appear to an observer having persistence of vision to be a composite three-dimensional image;

wherein the improvement comprises:

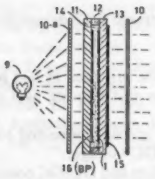
g. means, including selection means manually settable at any time, for controlling said illuminating means to illuminate only selected photographs of said series during each movement of the series through said optical path.

4,294,524

IMAGE OR PICTURE PROJECTING SYSTEM USING ELECTRONICALLY CONTROLLED SLIDES

Michael Stolov, 25 Hapoel St., Nof-Yam, Herzlia, Israel

Division of Ser. No. 943,982, Sep. 20, 1978, Pat. No. 4,222,641.
This application May 16, 1980, Ser. No. 150,520
Claims priority, application Israel, Jun. 29, 1978, 55032
Int. Cl.³ G03B *21/00, 21/14;* H04N *9/31*
U.S. Cl. 353—84 **17 Claims**



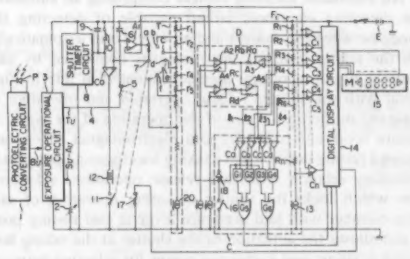
1. A changeable image or picture system for producing complex, colored, images or pictures, the system comprising a light source; liquid crystal display means for displaying images or pictures spaced from said light source; at least one electronically controlled liquid crystal multiple color filter positioned between said light source and said liquid crystal display means; a light scattering means positioned between said at least one electronically controlled multiple color filter and said liquid crystal display means for diffusing light which has passed through said at least one electronically controlled multiple color filter into light of substantially uniform intensity at any given time; a plurality of electrodes operatively associated with said liquid crystal display means; means for supplying selectively to individual ones of said electrodes associated with said liquid crystal display means voltages to make selected portions or said liquid crystal display means transparent thereby selectively passing area portions of light from said means tor diffusing; a screen; and lens means for projecting the area portions of light passing through said liquid crystal display means onto said screen; whereby colored, complex images or pictures appear on the screen.

4,294,525

CAMERA HAVING A DIGITAL EXPOSURE VALUE DISPLAY DEVICE

Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 14, 1980, Ser. No. 196,358
Claims priority, application Japan, Oct. 20, 1979, 54-135507
Int. Cl.³ G03B *7/091, 9/62, 17/18*
U.S. Cl. 354—23 D **9 Claims**



1. A camera having a digital exposure display device (C_1–C_n, **14**, **15**) for comparing a voltage associated with an exposure value such as a shutter time value or an aperture value obtained from exposure operating means (**P**, **1**, **2**, **3**, **4**, **5**, **6**, A_1) with a plurality of reference voltages produced by a reference voltage generating circuit (F_1) and thereby converting the exposure value into a digital signal and digitally displaying said exposure value on the basis of said digital signal, said camera further having a digital fixed point match type exposure display device comprising:

an exposure value setting circuit (T) for generating a voltage associated with a manually set exposure value;

differential amplifier circuit means (D) for generating a voltage including a voltage corresponding to the difference between the voltage of said exposure value setting circuit (T) and the voltage obtained from said exposure operating means;

forming means (I_1–I_4) for forming a first comparison voltage and a second comparison voltage greater than said first comparison voltage by using the output voltage of said reference voltage generating circuit;

comparing means (C) for comparing the comparison voltage of said forming means (I_1–I_4) with the output of said differential circuit means (D) and producing a first signal variable in condition depending on whether said output is smaller or greater than said first comparison voltage and a second signal variable in condition depending on whether said output is greater or smaller than said second comparison voltage; and

display means (**14**, **15**) operative to effect a display based on said first and second signals of said comparing means.

4,294,526

AUTOMATIC FOCUSING CAMERA COMBINED WITH MANUAL FOCUSING SYSTEM

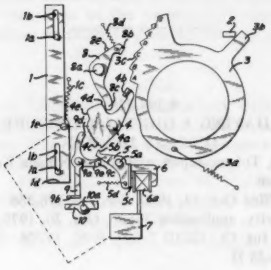
Tadashi Nakagawa, Yotsukaido, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1980, Ser. No. 188,115

Claims priority, application Japan, Oct. 27, 1979, 54-148913[U]

Int. Cl.³ G03B *3/10, 7/08*

U.S. Cl. 354—25 **1 Claim**



1. An automatic focusing camera comprising an automatic focus detecting electronic circuit capable of detecting the distance between the camera and an object and automatically focus the taking lens, an electromagnet controlled by said electronic circuit, a release member actuated in interlocking relation with the shutter release operation and operative to actuate the shutter at the end of the operation of the same, an armature lever controlled by said electromagnet to operate between a resting position and a taking lens focusing position in interlocking relation with said release operation, a locking means which locks the shutter actuating operation of said release member with said armature lever at said resting position and allows the actuation of the shutter at the taking lens focusing position, and a selecting means for selecting between automatic focusing mode and manual focusing mode and operative to retract said locking means to a position where said locking means will not lock said release member when said manual focusing mode is selected.

4,294,527

MOTOR DRIVEN CAMERA

Akihiko Hashimoto; Yukio Nakajima, both of Hachioji; Tamotsu Koiwai, Shimosuwa, and Toyohiko Kimura, Hachioji, all of Japan, assignors to Olympus Optical Company, Ltd., Japan

Filed Jan. 7, 1980, Ser. No. 109,764

Claims priority, application Japan, Feb. 2, 1979, 54-11260

Int. Cl.³ G03B *1/12, 3/00*

U.S. Cl. 354—25 **14 Claims**

1. A motor driven camera, comprising:

a camera body;

a film winding shaft disposed in said camera body;

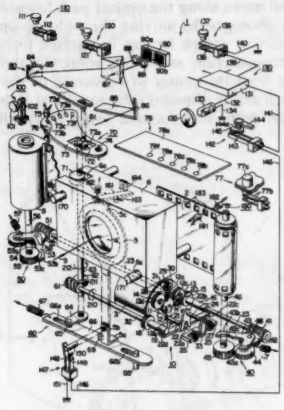
a film rewind shaft disposed in said camera body parallel to said film winding shaft;

a single reversible drive motor disposed in said camera body, said motor having an output shaft;

a first connection shaft disposed in a direction perpendicular to the direction of extension of said film winding shaft and said film rewind shaft; said first connection shaft having two ends;

a motor drive transmission mechanism for transmitting drive from said motor to said first connection shaft;

a film winding mechanism adjacent one said end of said first connection shaft for selectively transmitting drive from said first connection shaft to said film winding shaft; and



a film rewind mechanism adjacent the other said end of said first connection shaft for selectively transmitting drive from said first connection shaft to said film rewind shaft.

4,294,528

AUTOMATICALLY CONTROLLED ELECTRONIC FLASH DEVICE

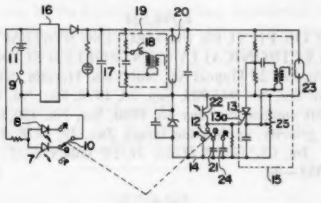
Yoshiharu Ohta, and Mikio Naya, both of Izumi, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 20, 1979, Ser. No. 67,968

Claims priority, application Japan, Aug. 23, 1978, 53-103054

Int. Cl.³ G03B *15/05;* **H05B** *41/32*

U.S. Cl. 354—33 **8 Claims**



1. An automatic electronic flash device for use with a camera, comprising:

a housing;

an electronic flash tube provided in said housing;

a battery provided in said housing as a source of electric supply;

a DC-DC converter circuit connected to said battery for generating a high DC voltage;

a capacitor connected to said DC-DC converter circuit to be charged up to the DC voltage and connected to said flash tube to energize said tube when discharged;

a manual switching member provided on said housing, said switching member having a plurality of settable positions;

calculator means carried on said housing for calculation of a plurality of combinations of aperture settings and distance settings in response to a film speed setting;

a plurality of illuminators each of which is associated with said calculator means for indication of one of said combinations calculated by said calculator means;

a control circuit having a light receiving element, said control circuit adapted for adjusting the amount of light emitted from said flash tube in accordance with a film speed setting and the intensity of light which is reflected

by an object to be photographed and received by said light receiving element during the firing of said flash tube;

means connected to said control circuit for adjusting the amount of light emitted from said tube in accordance with the setting of said manual switching member; and

means interlocked with said manual switching member for selectively and directly connecting one of said illuminators to said battery for energization thereof in accordance with the setting of said manual switching member.

4,294,529

CAMERA

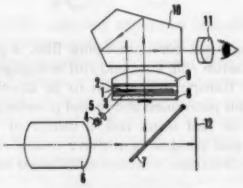
Yasuhisa Sato, Kawasaki; Sadahiko Tsuji, and Kazuo Ishikawa, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1979, Ser. No. 70,659

Claims priority, application Japan, Sep. 7, 1978, 53-122915[U]; Sep. 7, 1978, 53-122916[U]

Int. Cl.³ G03B *17/20*

U.S. Cl. 354—53 **8 Claims**



1. A camera apparatus, comprising:

a photo-taking optical system;

a finder optical system including a focusing screen;

a diffraction device arranged near one of a plurality of predetermined planes including a focal plane of said photo-taking optical system and an optically conjugate plane thereto and having recorded therein on indicium to be displayed;

a pair of optical members,

said diffraction device being supported and sealed between the two optical members;

a light source for illuminating said diffraction device from an oblique direction; and

an electrical power circuit for energizing said light source.

4,294,530

MOTORIZED PHOTOGRAPHIC SYSTEM AND CAMERA AND POWER DRIVE UNIT THEREFOR

Tomonori Iwashita, Fuchu; Hidehiko Fukahori, Kawasaki, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1979, Ser. No. 59,233

Claims priority, application Japan, Jul. 28, 1978, 53-92318

Int. Cl.³ G03B *1/18, 1/60*

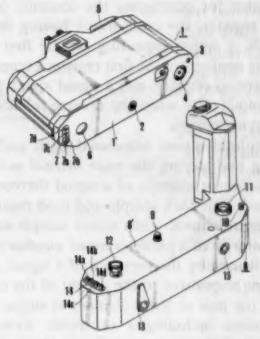
U.S. Cl. 354—173 **15 Claims**

1. A motor drive unit for a camera comprising:

an electric motor,

a control circuit connected to said electric motor to control the electrical power supply to said motor, said control circuit having a control input and responsive to at least an electrical control signal applied to said input for controlling the electrical power to said motor,

terminal means connected to the input of said control circuit to receive from the camera a combination signal including a first electrical signal indicating completion of a winding operation for advancing film one frame and a second electrical signal indicating completion of a rewinding operation for rewinding film in the camera, the combination signal representing winding completion signal when the first and second signals assume one set of states, and rewind completion signal when the first and second signals assume another set of states, and



a motion transmitting mechanism for transmitting the driving force of said electric motor to the camera to perform a winding or rewinding operation.

4,294,531

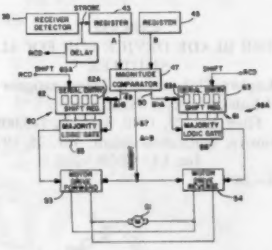
AUTO-FOCUS MOVIE CAMERA

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 899,785, Apr. 25, 1978, abandoned, which is a continuation-in-part of Ser. No. 729,289, Oct. 4, 1976, abandoned. This application Sep. 26, 1979, Ser. No. 79,052

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—195 **13 Claims**



1. In a camera having an adjustable lens for directing scene light onto a focal plane of a recording station when a shutter mechanism is operated, the lens having a predetermined lens/subject function that relates the desired focus position of the lens to the subject distance, and also having range finding means operable for generating a range parameter related to subject distance, the improvement comprising:

a programmer periodically operating the range finding means for generating a range parameter to track changes in subject distance;

first means responsive to the generation of a range parameter for generating a first number representative of the desired focus position of the lens;

a first register for storing said first numbers generated by said first means whereby the contents of this register varies in response to changes in subject distance at a rate dependent on the repetition rate of generation of said range parameters;

second means responsive to the position of the lens for generating a second number representative of the actual position of the lens;

a second register for storing said second number representative of lens position whereby the contents of the second

register varies in response to changes in the position of the lens at a rate determined by the rate of change of lens position;

a comparator for comparing the contents of the first and second register, the comparator having first and second terminals, a signal appearing on the first terminal only when the contents of the first register exceeds the contents of the second register, and a signal appearing on the second terminal only when the reverse relationship between the contents occurs;

sample-and-hold means associated with each terminal for sampling and storing the state thereof as determined by the presence or absence of a signal thereon, logic means associated with each sample-and-hold means for producing a control signal when either sample-and-hold means has a majority of a predetermined number of samples in a state indicated by the presence of a signal; and

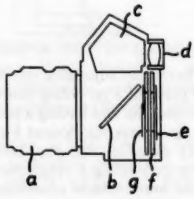
drive means responsive to the output of the comparator for causing the lens to track changes in subject distance, the drive means including a reversible motor operatively associated with the lens, a forward motor control for operating the motor in one direction to thereby move the lens in one direction, and a reverse motor control responsive to a signal on the second terminal for operating the motor in the opposite direction so as to move the lens in its opposite direction, the two motor controls being respectively responsive to the control signals of the sample-and-hold means for operating the motor in a direction that moves the lens mount toward a focus position at which the signals on the terminals are nulled.

4,294,532

SHUTTER BLADE DEVICE FOR FOCAL PLANE SHUTTER

Tadashi Nakagawa, Shikawatashi, Japan, assignor to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 23, 1980, Ser. No. 143,008
Claims priority, application Japan, Apr. 24, 1979, 54/51085
Int. Cl.³ G03B *9/40*
U.S. Cl. 354—246 **8 Claims**



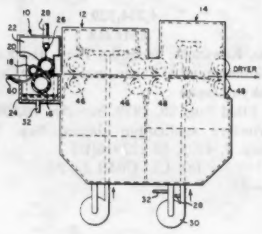
1. In a focal plane shutter for a single lens reflex camera having on the side of the shutter aperture two blade groups each consisting of a plurality of separate blades adapted to operate sequentially in exposure operation and located adjacent to the focal plane, a shutter blade device for the focal plane shutter including said two blade groups having at least some of blades formed of thin synthetic resin plates, and a reflex mirror, and characterized by a shielding member provided between the reflex mirror and said blade groups and adapted to retract from an aperture shielding position during the exposure operation of said two blade groups and return to an aperture shielding position before and after the exposure operation.

4,294,533

APPARATUS FOR PRE-CONDITIONING FILM

Martin D. Bratt, Old Bridge, and John F. Oakley, Parlin, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 889,420, Mar. 23, 1978, abandoned. This application Aug. 3, 1979, Ser. No. 63,471
Int. Cl.³ G03D *5/06*
U.S. Cl. 354—318 **6 Claims**



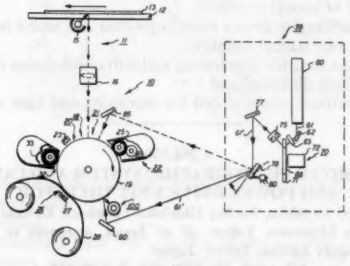
1. In an apparatus for developing film, a pre-conditioner comprising: a scrub roll; a second roll in engagement with the scrub roll for transporting a film to be developed therebetween; a conduit positioned above and provided with perforations directed at said scrub roll; a source of flushing liquid connected to said conduit; and drive means coupled to said rolls for their co-current rotation at different surface speeds.

4,294,534

MULTIPLE FUNCTION REPRODUCTION APPARATUS

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 14, 1980, Ser. No. 111,519
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **23 Claims**



12. In a copying apparatus having a photoreceptor, means to charge said photoreceptor in preparation for imaging, exposure means for exposing said charged photoreceptor to produce latent electrostatic images, developing means for developing said latent electrostatic images, and transfer means for transferring said developed images to copy substrate material, the improvement comprising:

a high intensity light beam;

means to focus said light beam onto said photoreceptor;

scanning means astride the path of said light beam for line scanning said light beam across said photoreceptor;

radiation detection means for converting scattered radiation resulting from scanning developed images on said photoreceptor with said beam to image signals representative of the image scanned; and

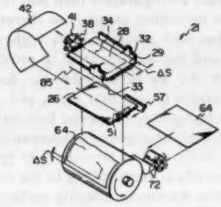
lens means for focusing said scattered radiation onto said radiation detection means.

4,294,535

ELECTROSTATIC COPYING APPARATUS

Kenzo Ariyama; Syozo Miyawaki, and Takashi Murakami, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 21, 1980, Ser. No. 114,016
Claims priority, application Japan, Jan. 30, 1979, 54-9412
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH **7 Claims**



1. An electrostatic copying apparatus including a transparent document support platen, document feed means for feeding an original document along a document feed path onto the platen in a first direction, a photoconductive member, imaging means for radiating a light image of the document onto the photoconductive member to form an electrostatic image, developing means for developing the electrostatic image to produce a toner image and transfer means for feeding a copy sheet into engagement with the photoconductive member in a second direction which is perpendicular to the first direction to transfer the toner image to the copy sheet, characterized by comprising:

document support means for supporting the document prior to feeding by the document feed means such that a center of the document is aligned with a center line of the document feed path;

sensor means for sensing a width of the document perpendicular to the document feed path;

sheet feed timing means for controlling the transfer means to begin feeding the copy sheet to the photoconductive member at a timing corresponding to a predetermined function of the width of the document such that a leading edge of the copy sheet aligns with a leading edge of the toner image on the photoconductive member.

4,294,536

AUTOMATIC CONTROL OF COPIER COPY CONTRAST AND DENSITY FOR PRODUCTION RUNS

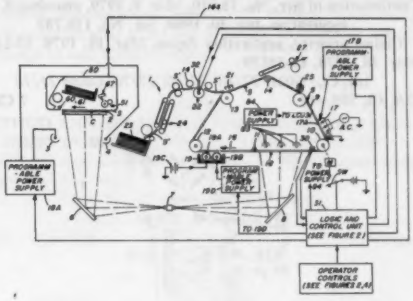
Kenneth B. Paxton, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1980, Ser. No. 154,747
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 C **12 Claims**

1. In apparatus for producing copies of a multi-sheet document which includes at least one sheet having a copy characteristic that is substantially different from the other sheets, said copier including adjustable control means for varying at least one copy process parameter to change copy contrast and density, and means for feeding seriatim the sheets of a multi-sheet document to a copying position to produce copies of the document, the improvement comprising:

(a) memory means for storing production run signals corresponding to (i) the number of copies to be made of a multi-sheet document, (ii) the copy process parameters for said multi-sheet document including the variation in said one copy process parameter for said one sheet, and (iii) the position of said one sheet in the multi-sheet document; and

(b) logic and control means responsive to said signals for operating said feeding means to sequentially feed the sheets of said multi-sheet document to said copying position and for setting said adjustable control means prior to copying said one sheet to produce copies of the document,



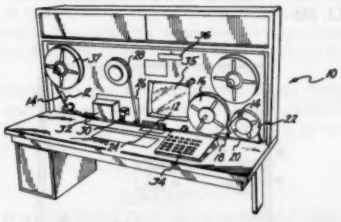
with each copy of a document sheet having a desired contrast and density.

4,294,537

PHOTOGRAPHIC REPRINT SYSTEM WITH INFORMATION DISPLAY

Ronald C. Laska, Minnetonka, and Janis Pone, Minneapolis, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 23,521, Mar. 23, 1979, abandoned. This application Jan. 7, 1980, Ser. No. 109,825
Int. Cl.³ G03B *27/72, 27/76*
U.S. Cl. 355—35 **12 Claims**



1. In a photographic reprint system in which photographic prints are produced from film frames of short previously-severed film strips which are connected together, the improvement comprising:

storage means for storing information for each film frame to be printed, the information including the number of prints to be made from each film frame;

a print gate at which light is directed through a film frame to expose a photosensitive medium and produce a print;

means for sequentially advancing the film frames to the print gate;

means for sequentially retrieving the stored information from the storage medium; and

means for displaying in human readable form information retrieved from the storage means in a predetermined time relationship with respect to the sequential advancing of the film frames to the print gate and printing of the film frames; and

means for displaying a human readable indication of the film frame for which information has been retrieved.

4,294,538

IMAGE FORMING OPTICAL SYSTEM

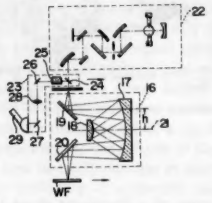
Mikichi Ban, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 18,910, Mar. 9, 1979, abandoned. This application Jan. 30, 1980, Ser. No. 116,752

Claims priority, application Japan, Mar. 18, 1978, 53-31578; Mar. 18, 1978, 53-31579

Int. Cl.[3] **G03B** *27/48, 27/50, 27/70;* **G02B** *21/18*

U.S. Cl. 355—51 **7 Claims**



1. An image forming optical system using a concave spherical mirror, said system comprising a band-like spherical mirror obtained by optically sectioning the concave spherical mirror, said band-like spherical mirror enabling the meridional light beam from a spot object on the rotational symmetry axis other than the center of curvature of the spherical surface of said band-like spherical mirror to be imaged on a predetermined surface perpendicular to said rotational symmetry axis, causing a sagittal light beam not to be imaged and enabling an arcuate image centered at said rotational symmetry axis to be obtained on said predetermined surface.

4,294,539

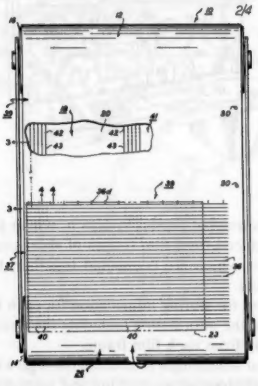
DOCUMENT VACUUM WEIR SYSTEM

Charles W. Spehrley, Jr., Lebanon, N.H., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1980, Ser. No. 111,059

Int. Cl.[3] **G03B** *27/62, 27/64*

U.S. Cl. 355—76 **9 Claims**



1. In a document handling system in which documents are moved with a vacuum belt to an imaging station of a copier where the documents are imaged against a light reflective document imaging surface on the first side of said belt, and in which the documents are attracted to said first side of said belt by an air flow applied from a vacuum manifold at the second side of said belt through multiple vacuum apertures extending through the belt and opening on said first side of said belt, the improvement wherein:

said apertures open on said first side of said belt only within minor, spaced, discrete limited first surface areas of said belt which first belt surface areas have a first convoluted surface configuration which holds the documents substantially spaced from said vacuum apertures and provides substantially unrestricted (low impedance) communication of said vacuum air flow under the documents from said apertures throughout said first surface areas,

said first surface areas of said belt surface being substantially enclosed by narrow border areas comprising unapertured pneumatic weirs

said weir areas having a second and much more finely convoluted surface configuration than said first surface areas,

said weir areas providing an air flow therethrough under a document, but with a substantially higher air flow impedance than said first surface areas to provide a substantial restriction in the air flow under the document to said vacuum apertures in said first areas, and

said weir areas being located on said belt surface at positions corresponding to the edges of a conventional size of documents, and configured to provide light reflective characteristics generally corresponding to the remainder of said light reflective document imaging surface of said belt to improve said imaging of documents against said belt.

4,294,540

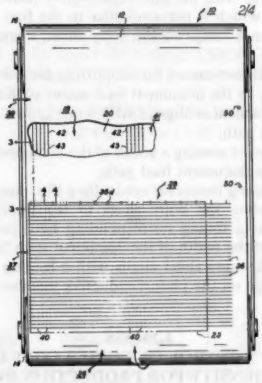
DOCUMENT BELT VACUUM MANIFOLD

Raghulinga R. Thettu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1980, Ser. No. 111,061

Int. Cl.[3] **G03B** *27/62, 27/64*

U.S. Cl. 355—76 **7 Claims**



1. In a document handling system in which documents are moved with a vacuum belt to an imaging station of a copier where the document are illuminated for imaging against a light reflective document imaging surface on a first side of said belt with a width greater than that of the document, and in which document handling system the documents are vacuum attracted toward said first side of said belt by an air flow applied from vacuum apertures in a light reflective vacuum manifold surface at the backside of said belt, which vacuum air flow is communicated from said manifold apertures through further apertures in said vacuum belt which open on said first side of said belt, the improvement wherein:

said vacuum manifold surface at said backside of said belt has elongated grooves slightly recessed in said manifold surface,

said manifold surface grooves extend in the direction of movement of said belt spaced apart transverse the direction of movement of said belt, and relatively narrow in comparison to the overall width of said vacuum belt,

said vacuum apertures in said vacuum manifold surface open

recessed within said grooves in said vacuum manifold surface;

said vacuum belt apertures are in narrow bands of apertures similarly transversely spaced apart and similarly extending in the direction of movement of said belt to generally overlie said grooves in said vacuum manifold surface,

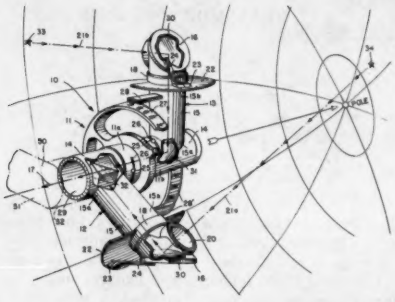
said manifold surface grooves have a sufficiently large cross-sectional area to provide relatively unrestricted air flow from said manifold surface apertures along said grooves under said belt to said vacuum belt apertures.

4,294,541

BI-PERISCOPIC INSTRUMENT FOR USE IN DETERMINING TERRESTRIAL POSITIONS THROUGH CELESTIAL OBSERVATION

William L. Abler, 3350 S. Michigan, Chicago, Ill. 60616

Filed Jun. 18, 1979, Ser. No. 49,567
Int. Cl.³ G01C *1/00, 1/14;* G02B *23/04*
U.S. Cl. 356—145 **9 Claims**



1. An instrument for use in establishing terrestrial positions through celestial observation, comprising in operative combination:

(a) an annular body having a central axis;

(b) a first periscope having a tubular axial portion coaxial with said body and a tubular arm portion with an axis extending radially from said central axis, said arm portion having a proximal end secured to said axial portion and having said radial axis thereof perpendicular to said central axis;

(c) a second periscope having a tubular axial portion coaxial with said body and a tubular arm portion with an axis extending radially from said central axis, said arm portion having a proximal end secured to said axial portion and having said radial axis thereof perpendicular to said central axis;

(d) said tubular axial portions of said periscopes being adjustably mounted upon opposite ends of said annular body for independent relative rotation about said central axis;

(e) each of said periscopes having rotatably mounted on a distal end thereof a turret having a sight opening;

(f) each of said turrets having reflecting means fixed therewithin for transmitting images from said sight openings to said central axis;

(g) one of said periscopes having a viewing opening for viewing along said central axis;

(h) said annular body having a single 360° scale extending circumferentially thereabout;

(i) indicator means disposed on each of said periscopes for indicating the angular position thereof along said scale and to indicate Local Hour Angle of Aries along said scale when said instrument is positioned for the viewing, in superimposed relation, a pair of celestial reference objects through said turret sight openings via said viewing opening; and

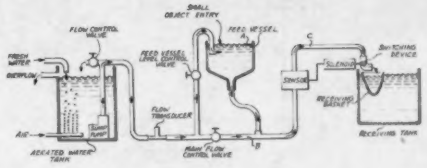
(j) direct-line-of-sight horizon viewing means for indicating the angle of said central axis from horizontal disposed connected to said viewing opening of said periscope, which viewing means provides for a central superimposed image of said celestial reference objects sighted through said turrets and a view of said horizon alignable with said central superimposed image, said horizon view being disposed located in an annular zone around said central image of said celestial objects.

4,294,542

METHOD AND APPARATUS FOR COUNTING SMALL OBJECTS SUSPENDED IN A LIQUID STREAM

Gary M. Strauss, Kent, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Dec. 17, 1979, Ser. No. 104,596
Int. Cl.³ B65G *51/36;* G06M *7/00*
U.S. Cl. 356—339 **17 Claims**



1. A method for counting suspended discrete small objects carried in a liquid stream which comprises:

a. splitting a liquid stream into primary and secondary streams;

b. introducing the objects into the moving secondary liquid stream, said stream having sufficient velocity to prevent settling or back movement;

c. recombining the primary and secondary streams;

d. maintaining the moving stream at a steady flow rate;

e. measuring turbidity of the stream containing the objects;

f. establishing a calibration algorithm of turbidity measurement versus number count of the objects for a given increment of time;

g. integrating the turbidity measurement over time and comparing the integrated value with the calibration algorithm;

h. providing an output signal responsive to the integrated value that indicates the number of individual objects that have passed the turbidity counter within a given time period.

4,294,543

OPTICAL SYSTEM FOR DEVELOPING POINT COORDINATE INFORMATION

Joseph Apple, Canoga Park, Calif., and Eric L. Upton, Mesa, Ariz., assignors to Command Control & Communications Corporation, Lomita, Calif.

Filed Nov. 13, 1979, Ser. No. 93,524
Int. Cl.³ G08C *21/00*
U.S. Cl. 356—375 **15 Claims**

1. A means for defining coordinates of an object intersecting a predefined plane, comprising:

a first rotatable means for sweeping a first light beam over a plane substantially coincident with said predefined plane;

a second rotatable means for sweeping a second light beam over a plane substantially coincident with said predefined plane;

an elongated light detection means positioned to be continuously irradiated by said first and second light beams while being swept over said predefined plane, said light detection means providing a first intersection pulse when said first light beam intersects and is blocked by said object and a second intersection pulse when said second light beam intersects and is blocked by said object;

first timing means for generating a first timing signal when

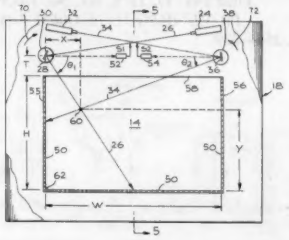
said first light beam is at a first predetermined reference angle;

second timing means for generating a second timing signal when said second light beam is at a second predetermined reference angle;

processor means responsive to the time duration between said first timing signal and said first intersection pulse and between said second timing signal and said second intersection pulse for producing X-Y coordinate signals defining the coordinates of said object;

said first rotatable means including a first motor;

a first tachometer providing an output signal indicative of the rotational velocity of said first motor;



a reference oscillator;

means for controlling said first motor rotational velocity in accordance with a phase difference between said first tachometer output signal and a signal produced by said reference oscillator;

a first voltage controlled ocillator; and

means for controling the frequency of said first voltage controlled ocillator in accordance with a phase difference between a signal related to the output of said first voltage controlled oscillator and said first tachometer output signal.

4,294,544

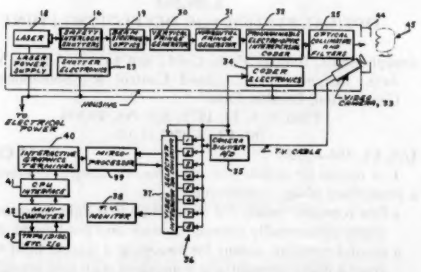
TOPOGRAPHIC COMPARATOR

Bruce R. Altschuler, 123 Thornell, San Antonio, Tex. 78235; John Taboada, 12530 Elm Country La., San Antonio, Tex. 78230, and Martin D. Altschuler, 228 Ranch Trail, Amherst, N.Y. 14221

Filed Aug. 3, 1979, Ser. No. 63,500

Int. Cl.³ G01B *11/00*

U.S. Cl. 356—376 **21 Claims**



1. Apparatus for providing three dimensional location information relative to a coordinate system for selected points on a remote surface, said apparatus comprising

a source of illumination for providing light beam illumination of said surface, said source of illumination comprising means for providing an array of light beams,

a scene recording device for providing surface scene images from an aspect angle other than parallel or normal to said light beam, each said surface scene image having an x,y coordinate system correlated with the surface x,y coordinate system, the elevation dimension of the surface at any selected illuminated x,y coordinate position being a function of (a) the displacement of the corresponding imaged spot from its x,y coordinates, (b) the scene recording device aspect angle and (c) surface to image coordinate system conversion factors, and

space coding means for correlating spots illuminated by said array of light beams with spots imaged by said scene recording device.

4,294,545

DEVICE FOR CONTINUOUSLY MEASURING A TRANSVERSE DIMENSION OF A THREAD-LIKE STRUCTURE

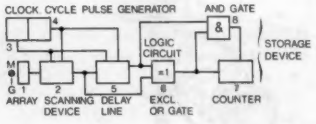
Hansruedi Stutz, Dietlikon, Switzerland, assignor to Gebrüder Loepfe AG, Zurich, Switzerland

Filed Dec. 10, 1979, Ser. No. 101,879

Claims priority, application Switzerland, Dec. 18, 1978, 12824/78

Int. Cl.³ G01B *11/10, 11/02*

U.S. Cl. 356—386 **5 Claims**



1. A device for continuously measuring a transverse dimension of a traveling yarn-like structure, comprising:

an array of optoelectrical sensors extending in a direction transverse to the traveling yarn-like structure;

means for scanning sensors of the array in consecutive cycles for producing a digital scanning signal in serial form;

means for delaying the digital scanning signal by an integer number $n \geqq 1$ of cycles;

logic means for producing a serial signal representative of the difference of the delayed and undelayed scanning signals;

means for storing consecutive serial signals, for producing a signal representative of an instantaneous transverse dimension of the yarn-like structure; and

the storing means being arranged as a counting device comprising a bidirectional counter, and an AND-gate having a first input connected to the output of the delaying means and a second input connected to the output of the logic means, the AND-gate having an output controlling the counting direction of the bidirectional counter.

4,294,546

APPARATUS FOR WORKING ALIGNED BORES

Irolt Killmann, St. Augustin-Mülldorf, and Georg W. Bonifer, Cologne, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Apr. 2, 1979, Ser. No. 26,076

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758742

Int. Cl.³ G01B *11/26*

U.S. Cl. 356—399 **8 Claims**

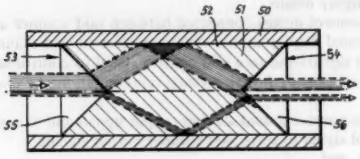
1. An apparatus for working with a tool at least one of a plurality of bores aligned on an axis wherein the bores are associated with the crankshaft bearings of internal combustion engines, said apparatus comprising in combination:

means for generating a laser beam to be passed through said bores and for aligning the laser beam with a longitudinal axis aligning said bores;

a driven hollow shaft for supporting said tool in one of said bores, said hollow shaft being positioned within said bore

and surrounding the longitudinal axis thereof and said hollow shaft being adjustable with respect to said laser beam to align with the laser beam and said longitudinal axis;

centering discs positioned in those bores not being worked on by said tool, said centering discs including means for indicating misalignment between said discs and said laser beam, said centering discs further including movable measuring devices and chucking means for adjusting and subsequently fixing, respectively, said centering discs within said bores wherein the centering discs are centered with respect to the bores;



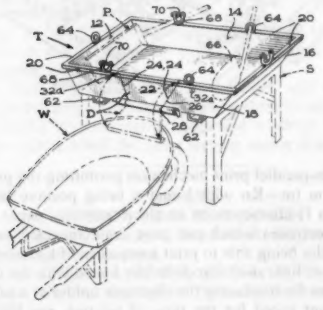
a cylindrical prism centrally mounted mounted within said hollow shaft for alignment with the laser beam, the prism having a cylindrical reflecting mantle surface and conical end surfaces having aligned axes which are aligned with the laser beam for initially splitting the laser beam into components which components reflect from said reflecting mantle surface and converge back to a single beam when the aligned axes are aligned with the laser beam and converge back into a plurality of beams when the aligned axes are out of alignment with the laser beam, whereby misalignment can be detected.

4,294,547

MORTAR/CONCRETE HAND-MIXING TUB

James F. Harkleroad, 9032 - 49th Ave., College Park, Md. 20740

Filed Jul. 20, 1979, Ser. No. 59,359
Int. Cl.³ B01F *13/00, 15/02*
U.S. Cl. 366—1 **14 Claims**



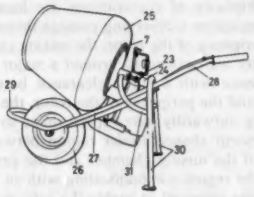
1. In a concrete or mortar mixing tub or box of the type having a flat bottom wall integrally joined with peripheral side walls upstanding therefrom and terminating in an upper edge forming an open top, the improvement comprising a selectively openable planar panel constituting a mortar discharge door formed in conjunction with a door opening provided in one of said peripheral side walls, said door panel being of lesser length than said side wall panel with which it is associated, and support and retaining means operatively connected with said side wall and said door to facilitate its selective opening and closing.

4,294,548

DRIVE ARRANGEMENT FOR CONCRETE MIXERS

Arthur Watson, Sellicks Beach, Australia, assignor to Lightburn & Co. Limited, Novar Gardens, Australia

Filed Mar. 21, 1980, Ser. No. 132,404
Int. Cl.³ B28C *5/18*
U.S. Cl. 366—60 **3 Claims**



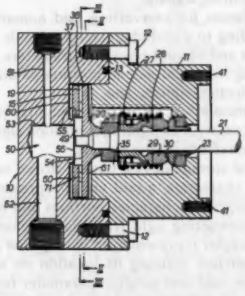
1. A concrete mixer drive arrangement, said mixer including a bowl having a base and an axis of rotation extending through the base, said bowl being supported by a shaft extending from the base of the mixer, a ring gear on said base about the shaft, a drive shaft having a pinion arranged to operably engage said ring gear, an electric motor having a motor shaft, a multiple stage speed reduction operably connected between said motor shaft and drive shaft, said motor shaft extending at a right angle to said axis of rotation, said drive shaft extending parallel to said motor shaft, characterized in that said multiple stage speed reduction comprises a three-stage V-belt drive including pulleys and driving belts, said first stage comprising a pulley fast to said motor shaft driving a pulley loose on said drive shaft, said second stage comprising a pulley loose on said drive shaft and drivingly connected to said first mentioned pulley on said drive shaft driving a pulley loose on said motor shaft, and said third stage comprises a further pulley loose on said motor shaft and drivingly connected to said first mentioned loose pulley on said motor shaft driving a drive pulley fast on said drive shaft.

4,294,549

MIXING APPARATUS

Raymond V. Thompson, Stocksfield; Alan Todd, Chester-le-Street, and Albert B. Constantine, Great Lumley, all of England, assignors to Dynatrol Consultants (U.K.) Limited, Newcastle-upon-Tyne, England

Division of Ser. No. 749,369, Dec. 10, 1976, Pat. No. 4,172,668.
This application Jun. 14, 1979, Ser. No. 48,383
Claims priority, application United Kingdom, Dec. 12, 1975, 51027/75; Aug. 26, 1976, 35600/76
Int. Cl.³ B01F *5/06, 5/12*
U.S. Cl. 366—164 **3 Claims**



1. Apparatus for mixing fluids comprising a housing affording a substantially annular mixing chamber, an annular rotor

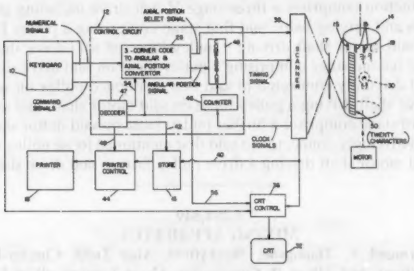
mounted for rotation in the mixing chamber, the rotor having one or more inlet orifices disposed at or adjacent its axis of rotation, an inlet chamber communicating with the inlet orifices in the rotor and disposed at or adjacent the axis of rotation of the rotor, the inlet chamber being provided with inlet means for the fluids to be mixed, outwardly extending passages being located in the rotor, and leading from the said inlet orifices to the periphery of the rotor and emerging therethrough, each passage diverging from an inlet to a constriction region in which a multiplicity of constrictions are located and each passage issuing out as a diverging passage through an annular wall at the periphery of the rotor, the mixing chamber having a circular outer wall extending around a major proportion of its circumference with a small clearance between the said circular wall and the periphery of the rotor, the circular outer wall extending outwardly into a spiral shape so as to define a generally crescent shaped outlet region between the spiral shaped wall of the mixing chamber and the periphery of the rotor, the outlet region communicating with an outlet passage and drive means arranged to enable the rotor to be rotated in the mixing chamber.

4,294,550

IDEOGRAPHIC TYPEWRITER

An Wang, Lincoln, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Mar. 10, 1980, Ser. No. 129,074
Int. Cl.[3] B41J *5/00, 5/44*
U.S. Cl. 400—110 **1 Claim**



1. An ideographic typewriter comprising:

a keyboard providing keys for generating numerical signals representative of numerical values corresponding to an ideographic character, and command signals representative of operational commands,

control means connected to said keyboard for receiving said signals and including

decoding means responsive to said command signals for deriving control signals,

conversion means for converting said numerical signals corresponding to a said character to signals representative of first and second position parameters, and means for deriving from said second position parameter signal element selection signals, and

comparator means for comparing said first position parameter signal with an input first position signal, and for deriving therefrom timing signals,

a rotating optical storage device having stored visual representations of characters, a said visual representation of a character comprising character portions and background portions of contrasting light transmission characteristics, each said character representation having first and second position parameters defining its location on said optical storage device, said first position parameter being related to the rotational position of said device, said optical storage device providing to said control means a signal representative of its rotational position,

a light source directing light through at least a group of said visual representations having a common value of said first position parameter,

a scanner disposed to receive light from an opposed group of said visual representations having a common value of said first position parameter, said scanner comprising a plurality of light-sensitive elements having positions corresponding with the range of said second position parameter of said visual representations, said elements being selectively actuatable in response to said timing and element selection signals, an actuated said element being selectively responsive to the presence and absence of incident light to generate output signals having either of two possible values,

visual display means,

display control means connected between said scanner and said visual display means and responsive to said scanner output signals and to a said control signal to control said display means to display a visual representation of a character,

a store responsive to said scanner output signals and to a said control signal to store said scanner output signals,

a printer, and

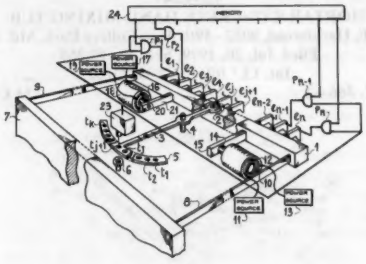
printer control means connected between said store and said printer and responsive to a said control signal to cause said printer to print a character corresponding to said input numerical signals.

4,294,551

SERIES-PARALLEL PRINT MECHANISM FOR PRINTER

Felix Chehovah, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 25, 1979, Ser. No. 78,804
Claims priority, application France, Sep. 29, 1978, 78 27921
Int. Cl.[3] B41J *3/10, 3/16*
U.S. Cl. 400—119 **2 Claims**



1. A series-parallel print mechanism permitting the printing of lines of m (m=Kn with k and n being positive integers greater than 1) characters on an electrosensitive paper, comprising n electrodes which can print simultaneously, each of said electrodes being able to print a sequence of k consecutive characters per line, an electrode holder linked with the n electrodes, means for displacing the electrode holder at a substantially constant speed for the time of printing one line, and means for fixing the position of each character to be printed during this displacement; a mechanical coupling member fixed to the electrode holder where the position fixing means comprise a plate having k holes, a fixed optical reading device, a fixed pin, a rod having first and second ends pivoting at a point located between its ends about the fixed pin, and whose first end is coupled with the mechanical coupling member and whose second end supports the plate having k holes, said holes and the optical reading device being disposed in such a way that for a displacement of the electrode holder corresponding to the printing of one line the optical reading device reads each of the k holes and whereby for each reading of a hole the

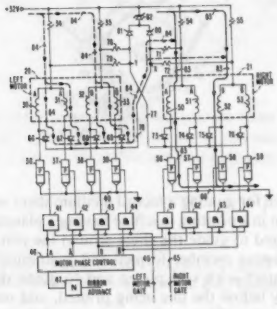
reading device supplies an electrical control signal to permit the printing of one character by each of the n electrodes.

4,294,552

BIDIRECTIONAL RIBBON DRIVE CONTROL FOR PRINTERS

John Mako, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1980, Ser. No. 115,849
Int. Cl.³ B41J *33/40*
U.S. Cl. 400—219.1 **7 Claims**



1. A printer for printing characters on a print medium via an ink ribbon having a reversible ribbon drive for feeding said ribbon during printing comprising:

a pair of ribbon spools,

first and second stepper motors connected separately to said spools,

said first and second stepper motors each including windings for the operation thereof,

control circuitry for operating said stepper motors such that when one stepper motor is driven, the other stepper motor is dragged,

said control circuitry comprising a first set of motor drivers connected to said windings of said first stepper motor,

a second set of drivers connected to said windings of said second stepper motor,

means for applying phase sequencing signals to either said first or second set of drivers for driving only one of said stepper motors,

and cross-coupling connections between said windings of said first and said second stepper motors forming a current path for drag current between said windings of one stepper motor when the other stepper motor is driving.

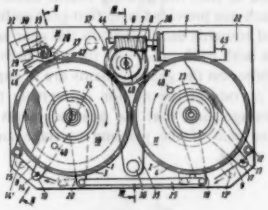
4,294,553

RIBBON FEED MECHANISM

Werner Wüthrich, Gümligen, Switzerland, assignor to Autelca AG, Güligen, Switzerland

Filed Apr. 18, 1980, Ser. No. 141,476
Claims priority, application Switzerland, Apr. 20, 1979, 3717/79
Int. Cl.³ B41J *33/44, 33/46*
U.S. Cl. 400—219.1 **9 Claims**

1. A ribbon feed mechanism comprising, first (**2,4,11**) and second (**1,3,10**) ribbon spool carrier means rotatably connected on axes adjacent each other and adapted to feed ribbon (**9**) from one to the other, a reversible electrical drive motor (**5**) that is reversible for reversing the ribbon feed direction between said first and second ribbon spool carrier means, a reversing switch (**32**) having two switch positions connected to control said drive motor (**5**), two mutually coupled ribbon guide means (**13,17,18,25 & 14,19,20**) respectively, pivotally connected for movement about the respective axes of said first and second ribbon spool carrier means, first catch means on the ribbon (**9**) adjacent one of its ends adapted to engage one of said ribbon guide means (**13**) and pivotally move said two mutually coupled ribbon guide means from a first position (**13,14**) coordinated with the first ribbon feed direction into a second position (**13',14'**) coordinated with the opposite ribbon feed direction, second catch means on the ribbon (**9**) adjacent its other end adapted to engage the other of said ribbon guide means (**14**) and pivotally move said two mutually coupled ribbon guide means from the second position (**13',14'**) into the first position (**13,14**), operating means (**21,27,31**) connected with the mutually coupled ribbon guide means and connected



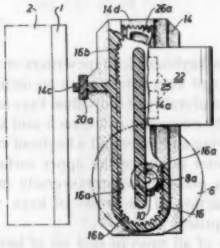
to actuate said reversing switch (**32**) between its two switch positions, said operating means (**21,27,31**) in the first position of said ribbon guide means (**13,14**) connected to actuate said reversing switch (**32**) to its first switch position which coordinates the direction of rotation of said drive motor (**5**) to that which transports the ribbon (**9**) in the first ribbon feed direction, and said operating means (**21,27,31**) in the second position of said ribbon guide means (**13',14'**) connected actuate said reversing switch (**32**) to its second switch position which coordinates the direction of rotation of said drive motor (**5**) to that which transports the ribbon (**9**) in the opposite ribbon feed direction.

4,294,554

DRIVING DEVICE FOR A PRINTING CARRIAGE PROVIDED WITH A PRINT HEAD

Mats E. Mattsson, Sollentuna, Sweden, assignor to Svenska Kassaregister AB, Solna, Sweden

Filed May 23, 1979, Ser. No. 41,726
Claims priority, application Sweden, Jun. 6, 1978, 7806627
Int. Cl.³ B41J *19/00*
U.S. Cl. 400—320 **1 Claim**



1. A driving device for a printing carriage with a print head including printing elements actuable to print characters on a data carrier, the driving device including a motion converting means and a pinion driven by a motor and always in engagement with an inner continuous gear path on the motion converting means, said gear path consisting partly of two opposed essentially straight first gear paths located at a distance from each other greater than the outer diameter of the pinion and partly of second gear paths connecting said first gear paths and located at a distance from each other essentially exceeding the

distance between the first gear paths, the motion converting means converting the rotational movement of the pinion to a reciprocating movement of the print head along the data carrier, the driving device further including guiding means in engagement with each other, with the motion converting means and with the printing carriage, the guiding means moving the printing carriage in the printing direction when the pinion is in engagement with any of the first gear paths of the motion converting means and permitting the displacement of the motion converting means essentially perpendicularly to the printing direction when the pinion is in engagement with any of the second gear paths of the motion transmitting means, characterized in that the guiding means consist of two gear segments each one provided with two gear paths, that the gear paths turned towards each other on the gear segments are in engagement with each other and the gear paths turned away from each other on the gear segments are in engagement with gear paths on one of the motion converting means and the printing carriage, and that the gear segments are pivotally supported on one of the printing carriage and the motion converting means.

4,294,555

MULTI-ROW KEYBOARD FOR TYPEWRITERS OR SIMILAR MACHINES

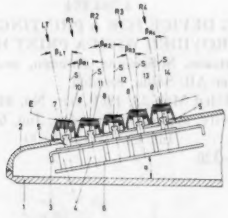
Folker Galaske, and Oswald Hack, both of Pforzheim, Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 28, 1980, Ser. No. 116,228

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 2903780

Int. Cl.³ B41J *5/10, 5/16*

U.S. Cl. 400—488 **4 Claims**



1. A multi-row keyboard for typewriters or similar machines comprising a set of keys arranged in an inclined position (α) and comprising a plurality of individual keys arranged in parallel, longitudinally extending rows, each said key comprising a key element having a plunger and a keyhead connected to said plunger, the center points of the upper surfaces of said keyheads lying in a plane dished transversely in relation to the longitudinal direction of said rows of keys, wherein the improvement comprises:

said keyheads of all rows of said set of keys all having the same shape;

an adapter being located between each said plunger and its associated keyhead;

the heights of said adapters differing from row to row of said keys; and

said adapters having supporting surfaces for their respective keyheads having a slope (angle β) differing from row to row of said keys, said slope angles of said supporting surfaces being selected to cause said upper surfaces of said keyheads to lie in said dished plane.

4,294,556

GUIDE FOR RECORD CARRIER IN PRINTERS

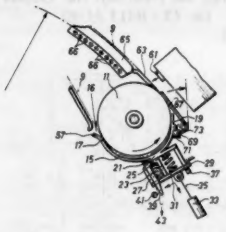
Albert Rix, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Jul. 9, 1979, Ser. No. 56,001

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2829827

Int. Cl.³ B41J *3/04, 13/18*

U.S. Cl. 400—643 **14 Claims**



1. A device for guiding a record medium sheet which is to be printed upon in a printing machine having a platen, said device being arranged to guide the sheet around the platen and comprising: an apron member formed and positioned to hold the sheet in contact with said platen and to guide the sheet at a point closely below the line being printed, said member being constructed to conform to the curvature of the lower portion of said platen and presenting a press and guide edge at each end of said member in the direction of the circumference of said platen; and spring biassing means disposed for pressing said member resiliently against said platen to cause said edges to bear against said platen; wherein said member is of a material selected so that the coefficient of friction between the record medium sheet and said press and guide edges is less than the coefficient of friction between said platen and the record medium sheet, said apron member is provided with at least one bearing portion presenting a guide slot, said portion being mounted to be slidable and pivotal relative to a pivot axis fixed relative to the machine and extending parallel to the axis of said platen, said spring biassing means act on said member via said bearing means, and said spring biassing means are constructed and mounted for pressing said apron member against said platen in a manner to establish a self-centering action between said press and guide edges and said platen.

4,294,557

SHIELD FOR TYPEWRITER KEYBOARD AND CYLINDER

Carroll H. Blanchard, 26 S. Royal Dr., Albany, N.Y. 12205, and Robert P. Marcelonis, 170 Ottawa St., Lake George, N.Y. 12845

Filed Dec. 27, 1979, Ser. No. 107,543

Int. Cl.³ B41J *29/12*

U.S. Cl. 400—714 **4 Claims**

1. A portable and compact shield for use with a typewriter supported by legs and having a keyboard, a cylinder and a casing comprised of:

a keyboard screen;

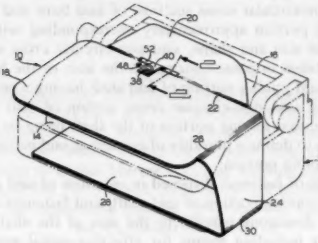
a cylinder screen hingedly connected to the keyboard screen;

vertical extension member hingedly connected to the keyboard screen on one side thereof and adapted to extend vertically downwardly from the keyboard screen along the side of the typewriter;

a lateral extension member hingedly connected to the vertical extension member, said lateral extension member being of sufficient length to extend under at least one of the legs of the typewriter; and

means for flexibly and releasable fastening the keyboard screen to the casing of the typewriter,

once the keyboard screen is released from the casing, the hinge between the keyboard screen and the vertical extension and the hinge between the vertical and lateral extensions being such as to permit the screens to be lifted away and folded off to the side of the typewriter for unobstructed access to the keyboard and cylinder.

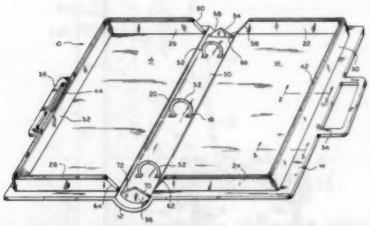


4,294,558

WEATHERPROOF PORTFOLIOS

Dominic R. Errichiello, 389 Meadowlark Rd., Bloomingdale, Ill. 60108

Filed Aug. 6, 1979, Ser. No. 63,865
Int. Cl.[3] A45C *3/02*; B65D *43/14*
U.S. Cl. 402—75 **4 Claims**



1. An integrally molded weatherproof portfolio of a thermoplastic polymer comprising an elongated spine having a first side panel and a second side panel hingedly mounted on respective, opposite, longitudinal edges of said spine, each said panel having two integrally molded side flanges connected by an integrally molded top flange to form two opposite, three-sided, substantially identical enclosures on respective panels, the longitudinal edges of said two side flanges and said top flange of the respective enclosures being aligned when said side panels are swung about their hinges from an open position toward each other and into abutting contact by said flanges in the closed position, and sealing means comprising longitudinal tongues and mating longitudinal grooves on respective longitudinal edges of said flanges providing a substantially water-tight seal when the edges of respective enclosures are in abutting contact;

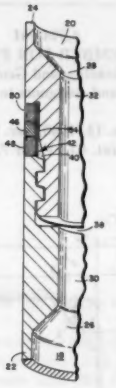
and a substantially triangular wall near each end of said spine and aligned with respective side flanges on the respective panels, said side flanges each having a diagonal edge adjacent said spine, which edge abuts against one of the diagonal walls of said triangular wall when said portfolio is in the closed position, and sealing means on the respective edges of said diagonal walls to provide a substantially water-tight seal between said edges when they are in abutting contact.

4,294,559

PRE-STRESSED STRUCTURAL JOINT

Jerome C. Schutzler, El Toro, Calif., assignor to PDA Engineering, Santa Ana, Calif.

Filed Aug. 27, 1979, Ser. No. 70,167
Int. Cl.[3] F16B *4/00*; F16D *1/00*; F16L *25/00*
U.S. Cl. 403—28 **6 Claims**



1. A structural joint wherein two portions of a structure are joined together by a connection means at a parting line which joint comprises:

a first member;

a second member;

a connection means;

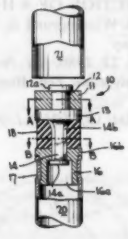
a third member interposed within said connection means which has been formed from a nickel-titanium alloy containing up to 5% by weight of cobalt and which has been compressively deformed below its transformation temperature to provide an expansive stress against said connection means and said first and second members when at ambient temperature.

4,294,560

LOCKING MEANS

Miles K. Larkin, 13 Roadley Ave., Pakuranga, Auckland, New Zealand

Filed Mar. 12, 1980, Ser. No. 129,665
Int. Cl.[3] F16B *7/10*
U.S. Cl. 403—104 **8 Claims**



1. Locking means for inner and outer telescopically engageable tubes, including at least one primary locking member and at least one secondary locking member in the form of a substantially resilient bushing mounted within a section of the inner tube which is within the outer tube, so as to be engageable with the inner surface of the outer tube, the primary locking member and resilient bushing being mounted relative to the inner

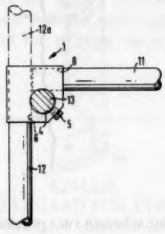
tube and to each other so that relative rotational movement between said inner and outer tubes causes said primary locking member to lockingly engage the inner surface of said outer tube and a further relative axial movement between said inner and outer tubes causes said resilient bushing to be compressed longitudinally and thereby to expand substantially radially into engagement with the inner surface of said outer tube.

4,294,561

JOINTING MEMBER FOR FRAME SYSTEMS

Arthur J. Chapman, Reading, and Geoffrey M. G. Hayes, Weybridge, both of England, assignors to Pentabloc, Ltd., London, England

Filed Jan. 14, 1980, Ser. No. 111,675
Int. Cl.³ F16B *7/04*
U.S. Cl. 403—219 **10 Claims**



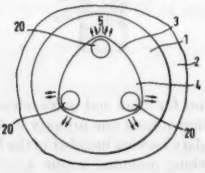
1. A jointing member for a frame system comprising: a member having three bores therein with the axes of said bores mutually perpendicular and with two of said bores lying in the same plane, and securing means for securing an elongate member engaged in one of said bores against longitudinal movement with respect to said member, said bores being so interconnected within said member that tightening said securing means to secure an elongate member in one of said bores, said one of said bores being other than one of said two bores lying in said plane, will secure respective elongate members engaged in the others of said bores against longitudinal movement with respect to said member; wherein said securing means is a set screw engaged in a screw-threaded hole in said member and engageable, by screwing it inwardly, with the elongated member engaged in said one of said bores, to press that elongate member against the elongate members engaged in said others of said bores to bind them therein, and wherein one of said two bores lying in the same plane is a blind bore.

4,294,562

POLYGON CONNECTION OF A HUB WITH A SHAFT

Ralph Müllenberg, Im Wiesengrund 6, 4048 Grevenbroich 12, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,484
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929908
Int. Cl.³ F16D *1/06*
U.S. Cl. 403—383 **1 Claim**



1. A polygonal connection for joining a hub with a shaft, said hub and shaft each having an axis, the connection comprising:

a bore of non-circular cross section in the hub;

a joining portion of non-circular cross section in the shaft, said joining portion of said shaft fitting within said bore, said non-circular cross sections of said bore and of said joining portion approximately corresponding with each other in size and shape, said non-circular cross sections being taken in planes normal to the axes of the hub and shaft, said joining portion of said shaft having a perimeter defining said non-circular cross section of said joining portion, said joining portion of the shaft being so configured as to define a plurality of corners at said perimeter of said joining portion;

a plurality of fasteners disposed in vicinities of said corners of said joining portion of said shaft, said fasteners extending in directions parallel to the axis of the shaft; each fastener including means for effecting radial expansion thereof, said fasteners having longitudinal axes located within said perimeter of said joining portion of said shaft;

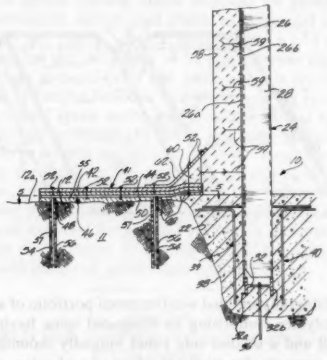
said fasteners being disposed entirely within said perimeter of said joining portion of said shaft.

4,294,563

THERMALLY INSULATED BULKHEAD FOR IN SITU OIL SHALE RETORT

James S. Kilburn, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Apr. 9, 1979, Ser. No. 28,226
Int. Cl.³ E21F *17/00*
U.S. Cl. 405—132 **37 Claims**



1. An insulated heat seal in an access drift adjacent a portion of in situ oil shale retort comprising:

a bulkhead placed across an access drift excavated in formation containing oil shale, the drift being in communication with a fragmented permeable mass of formation particles containing oil shale in an in situ oil shale retort, the bulkhead having an inside surface facing toward the fragmented mass, the access drift having an inside wall between the inside surface of the bulkhead and the fragmented mass;

a first layer of heat insulating material on the inside surface of the bulkhead for reducing heat transfer to the bulkhead from a hot portion of the fragmented mass in communication with said access drift; and

a second elongated layer of heat insulating material on the inside wall of the access drift on the same side of the bulkhead as the first layer of heat insulating material, the second layer of heat insulating material extending along the length of the inside wall of the drift away from the first layer of heat insulating material for reducing heat transfer from said hot portion of the fragmented mass to formation

forming the drift wall adjacent the inside surface of the bulkhead.

4,294,564

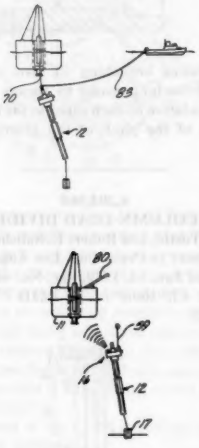
METHOD OF DEPLOYMENT, RELEASE AND RECOVERY OF OCEAN RISER PIPES

Abraham Person, Los Alamitos; Sherman B. Wetmore, Westminster, and James F. McNary, Santa Ana, all of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Division of Ser. No. 935,672, Aug. 21, 1978, Pat. No. 4,234,269. This application Jan. 14, 1980, Ser. No. 111,812

Int. Cl.³ E02D *21/00, 29/06*

U.S. Cl. 405—195 **9 Claims**



1. A method for connecting to a structure adjacent the surface of an ocean an elongate pipe assembly having overall negative buoyancy and which, when connected to the structure, depends downwardly from the structure and is supported thereby, the method comprising the operations of

(a) fabricating the pipe assembly to an essentially finished state at a location away from the structure, the upper end of the pipe assembly being sufficiently positively buoyant that the normal stable position of the assembly when submerged and released from support from above is substantially vertical,

(b) moving the pipe assembly in a horizontal attitude to the location of the structure,

(c) controllably lowering the pipe assembly toward the ocean floor and concurrently both maintaining a connection to the upper end of the assembly and causing the assembly to assume a vertical attitude in a fully submerged state thereof, the lowering operation including a further operations of (1) connecting a line from the structure to the lower end of the assembly while the assembly is horizontal at the location of the structure, and (2) paying out the line from the structure to lower the lower end of the assembly,

(d) moving the submerged vertically disposed pipe assembly to below the structure, and

(e) raising the pipe assembly into engagement with the structure and connecting the same to the structure for support thereafter by the structure.

4,294,565

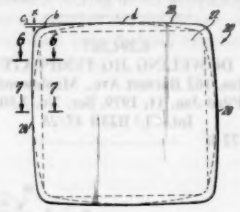
INDEXABLE FINISHING INSERT FOR A MILLING CUTTER

Donald S. Erkfritz, Clarkston, Mich., assignor to General Electric Company, Columbus, Ohio

Filed Mar. 6, 1980, Ser. No. 127,598

Int. Cl.³ B26D *1/12*

U.S. Cl. 407—113 **14 Claims**



1. A finishing insert for use with an indexable cutting tool, said insert comprising:

a flat wafer of cutting material having parallel, spaced front and rear planar rake surfaces and a plurality of edge faces disposed therebetween, said rake faces being of equilateral, polygonal configuration with the side edges of said polygonal front rake surface corresponding to the cutting edges of said insert, said cutting edges being arcuate having a radius of curvature several times greater than the width of said front rake surface and with the intermediate portion of each said edge face being substantially planar and defining a locating land, with at least a portion of the opposed ends of said edge faces being curved and sloped away from said front rake surface in order to provide clearance along said edge faces when said insert is mounted on a cutting tool at a rake angle between said front rake surface and the workpiece.

4,294,566

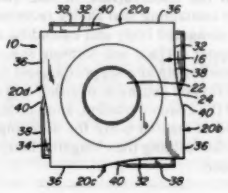
EIGHT EDGE POSITIVE CHIP CONTROL INSERT

Gary A. Boone, Farmington, Mich., assignor to Carmet Company, Pittsburgh, Pa.

Filed Jun. 16, 1980, Ser. No. 159,580

Int. Cl.³ B26D *1/00, 1/12*

U.S. Cl. 407—114 **10 Claims**



1. An eight-edge cutter insert adapted for use with a tool holder having an insert-receiving square pocket formed therein, said insert comprising:

a generally rectangular prismatic element of cutting material, said element having a pair of parallel, laterally offset primary faces, and four rectangular side faces each outwardly bounded by a respective side reference plane extending perpendicularly of said primary faces and the adjacent side reference planes,

each of said side faces having an opposed pair of recessed, beveled facets formed therein, said facets each intersecting a respective primary face to form a cutting edge ex-

tending parallel to the side reference plane of the side face containing the said facet,

each facet being inwardly inclined away from its respective cutting edge to define a shear angle measured from said side reference plane,

said side faces each having a diametrically opposed pair of flat lands substantially coplanar with a respective side reference plane whereby to define a planar base on each side face for permitting said cutter to be accurately located, and securely clamped, in said square pocket.

4,294,567

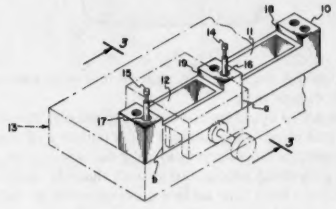
DOWELING JIG TEMPLATE

Garfield Wiggins, 162 Burnett Ave., Maplewood, N.J. 07040

Filed Jan. 11, 1979, Ser. No. 2,506

Int. Cl.[3] B23B *47/28*

U.S. Cl. 408—72 R **5 Claims**



1. In combination a template to support a doweling jig in a position above and parallel to a flat surface for drilling longitudinally spaced series of vertical dowel holes for mating with similiarly positioned holes in an edge or end of another workpiece to be joined in a right angle relationship to a flat surface, said doweling jig characterized by a horizontally elongated channel having a flat top member and two parallel side members extending transversely to said top member, said top member having parallel ends extending transversely to said side members and having an undersurface parallel with its upper surface and having longitudinally spaced vertical guide bushings through which a drill bit can pass for making spaced holes in a piece of stock beneath said undersurface, one of said side members having attached means for clamping a template against the other side member in a position for such drilling, said template characterized by a horizontally elongated body having at least one vertical cavity to allow passage of the drill bit through the guide bushing into the flat piece of stock held in contact with the undersurface of said elongated body, a channel portion containing said cavity recessed into the upper surface of said elongated body and extending across the entire width of said upper surface and forming spaced abutments to allow precise positioning and support against movement in one horizontal direction by abutment of either end of the flat top of the dowel jig in the channel portion, and vertical guide holes at each end of said elongated body for allowing the passage of securing means for holding the elongated body in contact with the flat workpiece.

4,294,568

PROCESS FOR BROACHING OF GROOVES

Dieter Lipowsky, Grobenzell, and Karl Meyle, Munich, both of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

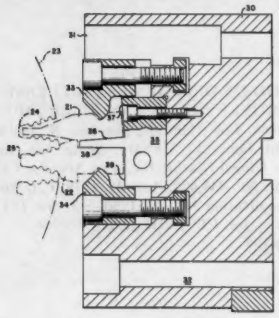
Continuation of Ser. No. 875,403, Feb. 6, 1977, abandoned. This application Nov. 29, 1979, Ser. No. 98,659

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1977, 2704812

Int. Cl.[3] B23D *37/04, 41/04*

U.S. Cl. 409—244 **12 Claims**

1. A process for production of a series of circumferentially adjacent retaining grooves for turbine blades in the peripheral surface of a rotor plate for a turbine engine by broaching, said retaining grooves being inclined with a predetermined pitch relative to the longitudinal axis of the rotor plate and being spaced from each other at a predetermined distance comprised



by the simultaneous broaching of two adjacent retaining grooves in one broaching stroke by means of two broaching tools positioned relative to each other at the distance and in the angular position of the pitch of the grooves that are to be produced.

4,294,569

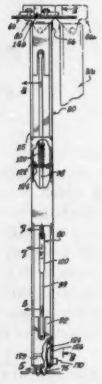
SINGLE COLUMN LOAD DIVIDING GATE

Alfred E. Lewis, Tustin, and Robert E. Salisbury, Whittier, both of Calif., assignors to Preco Inc., Los Angeles, Calif.

Filed Jun. 14, 1979, Ser. No. 48,454

Int. Cl.[3] B60P *17/14;* B61D *17/10*

U.S. Cl. 410—133 **23 Claims**



10. In a load dividing gate movable along a track and lockable by locking pin means projectable to engage the track, said gate having a vertical edge structure comprising spaced flanges with a web recessed between the flanges and forming therewith a channel; control mechanism for the locking pin means comprising

a crank shaft journaled on said web and terminating outward of the web in a coupling formation,

crank means mounted on the shaft and coupled to the locking pin means for operating the same in response to shaft rotation,

a handle rigidly carrying at one end coupling means for engaging and disengaging said coupling formation in response to respective movements of said one handle end along the shaft axis to and from said one end of the shaft,

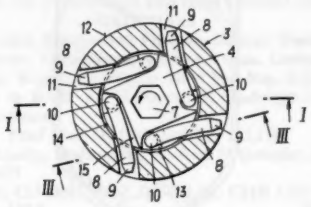
a support member mounted for rotation about the shaft axis, and linkage means for interconnecting the handle and the support member with freedom of relative movement sufficient to permit said axial handle movement and to permit handle movement to and from a stowed position radially spaced from the shaft and substantially within the channel.

4,294,570

LOCKABLE CAP SCREW

Albin Meschnig, Müllnern 72 (Kärnten), A-9585 Gödersdorf, Austria

Filed Feb. 21, 1979, Ser. No. 13,659
Claims priority, application Austria, Mar. 7, 1978, 1638/78; Sweden, Oct. 30, 1978, 7811221
Int. Cl.³ F16B *39/00*
U.S. Cl. 411—103 **13 Claims**



1. A lockable cap screw having a head formed with a bore opening in an outside peripheral surface of the head, and a pin slidable in said bore between a position of rest and an operative position in which an outer end of the pin protrudes over the outside peripheral surface of the head of the screw, comprising

means, comprising an actuating member engaging an inner end of the pin and being adjustable relative to the head of the screw, for shifting the pin to said operative position, said actuating member is formed with an opening, and the inner end of said pin is angled and enters said opening of the actuating member,

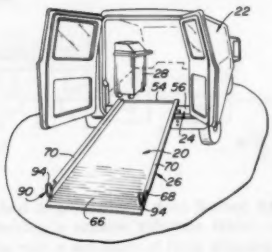
the bore in the head of the screw is oblique to a radial plane of the actuating member.

4,294,571

VAN PLATFORM WITH LOCKABLE RAMP

Joseph R. Tordella, 128 B Elm Dr., Medford, N.J. 08055

Filed Nov. 30, 1979, Ser. No. 99,069
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—537 **12 Claims**



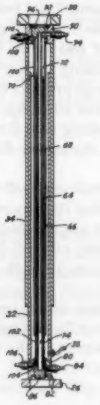
1. A van platform comprising a housing including first floor means terminating outwardly in an outer edge and defining a space thereunder, movable ramp means located in said space and having roller means to enable said ramp means to be extended from a retracted position within said space to an extended, ramp-functioning position outside said space, a pair of inclined guides positioned in said space adjacent the outer edge of said first floor, each of said guides being inclined upwardly and outwardly and including an indentation at the top thereof, said rollers being arranged to engage said inclined guides to facilitate movement of said ramp means to and from the extended position, at least one of said rollers being received in said indentation when said ramp means is brought to the extended position, and first releasable locking means for preventing said roller from moving inwardly out of said indentation when said ramp means is in said extended ramp functioning position, said releasable locking means comprising at least one stop member located adjacent said indentation and a movable to a position immediately inward of said indentation to engage the roller disposed therein.

4,294,572

INTERNAL FLUID COMMUNICATION SYSTEM FOR POWER CYLINDERS

Jack E. Pattison, 115 S. Ridgeway Dr., Battle Creek, Mich. 49015

Filed Apr. 10, 1978, Ser. No. 894,691
Int. Cl.³ B66F *9/22*
U.S. Cl. 414—641 **6 Claims**



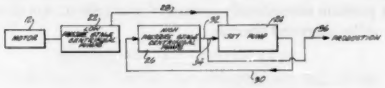
1. In a lift truck having an upright with two sections, each with spaced vertical side members, and a fluid operated attachment on said upright: a fluid operated ram disposed vertically between said side members and in spaced relation thereto and consisting of two ram sections with directly interconnecting chambers containing the operating fluid therefor, for operating said upright sections between raised and lowered positions, a conduit having a first pair of tubular sections comprising upper and lower tubular sections disposed in telescopic relationship lengthwise within the chambers containing the operating fluid of said ram and forming a first fluid passageway for transmitting fluid through said ram separate from the operating fluid therein, a bottom end member connecting the lower end of said lower tubular section with the lower end of said lower ram section, means forming a passage in said bottom end member for receiving fluid from a source to be transmitted through the first passageway in said telescopic sections, a top end member connecting the upper end of said upper tubular section with the upper end of said upper ram section, and means forming a passage in said top end member for transmitting the fluid in said first passageway to said attachment.

4,294,573

SUBMERSIBLE ELECTRICALLY POWERED CENTRIFUGAL AND JET PUMP ASSEMBLY

John W. Erickson, Huntington Beach, and Harold L. Petrie, Sierra Madre, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed May 17, 1979, Ser. No. 39,775
Int. Cl.[3] F04B *23/14*
U.S. Cl. 417—83 19 Claims



1. A downhole petroleum pump comprising:

(a) a housing adapted for residence in a downhole location within a well;

(b) an electric motor within the housing;

(c) a plurality of centrifugal pump stages within the housing and driven by the motor, the centrifugal pump stages being serially coupled and having at least one low pressure stage and at least one high pressure stage to progressively increase the pressure of well fluid from a low value at the low pressure stage to a high value at the high pressure stage;

(d) means for providing the well fluid as the fluid to be pumped to the centrifugal pump stages;

(e) a jet pump within the housing having means for receiving an aspirated fluid and means for receiving a power fluid;

(f) means for providing high pressure well fluid to the jet pump from the high pressure centrifugal pump stage as the power fluid for the jet pump;

(g) means for providing well fluid to the jet pump at a pressure lower than the power fluid as the aspirated fluid to the jet pump;

(h) means for recirculating well fluid from the output of the jet pump, including the power fluid, to the high pressure centrifugal pump stage including the power fluid;

(i) means for drawing off well fluid from the high pressure centrifugal pump stage as the production fluid from the well; and

(j) centrifugal cleaner means upstream of the jet pump for cleaning the power fluid of particulate matter, the cleaner means being powered by the electrical motor.

4,294,574

METHOD OF MAKING SEAL FOR FLEXIBLE CONTAINER

Edward L. Bayham, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 17,529, Mar. 5, 1979, Pat. No. 4,234,026.
This application Oct. 29, 1979, Ser. No. 89,815
Int. Cl.[3] B31B *1/84*
U.S. Cl. 493—213 13 Claims

1. The method of sealing a flexible container with an openable seal member which comprises:

inserting a thermoplastic tube between thermoplastic members with a portion of the tube communicating outwardly beyond said members;

enclosing the outer end of said tube with a thermoplastic pocket member having an open outer end;

inserting a mandrel through the outer end of said pocket member and said tube;

sealing said thermoplastic members, tube, and inner end of the pocket member together in a smooth, continuous seal such that the inner and outer ends of the tube communicate through said seal;

withdrawing said mandrel through the outer end of said pocket member; and

sealing the outer end of the pocket member.

4,294,575

PEROXIDE STABILIZATION

Xavier Kowalski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 403, Jan. 2, 1979, Pat. No. 4,239,643. This application Jul. 18, 1980, Ser. No. 170,201

Int. Cl.[3] D06C *3/02;* D21C *9/16*

U.S. Cl. 8—111 5 Claims

1. In a process for bleaching cellulose fiber with an aqueous peroxide-containing solution having a pH from about 7 to about 12.5, the improvement which comprises including in said solution from about 0.2 to about 20 grams per liter of alkali metal polyphosphate and from about 0.1 to about 10 grams per liter of alkali metal diethylene triamine penta(methylene phosphonate).

4,294,576

REMOVAL OF OLIGOMER DEPOSITS FROM TEXTILE MATERIALS

Herbert Helfert, Frankenthal; Friedrich Reinert, Wachenheim; Paul Richter, Friedelsheim; Michele Vescia, Limburgerhof, and Dieter Wegerle, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 22, 1980, Ser. No. 152,178

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 2925477

Int. Cl.[3] D06L *1/12;* D06P *5/02;* C11D *1/62*

U.S. Cl. 8—137.5 10 Claims

1. A process for removing oligomer deposits from textile materials which consist of polyester fibers or of blends of polyester fibers with other fibers, and from dyeing machinery, comprising:

treating said fibers or machinery with an aqueous alkaline liquor at a temperature from 30° to 100° C., containing as the active ingredient of the liquor, at least one quaternary ammonium compound whose quaternary nitrogen atom bears not less than two C_6-C_{22}-alkyl or -alkenyl groups with the remaining groups being selected from the group consisting of alkyl, aryl, alkylphenyl, aralkyl, alkylene oxide and RCO—X—$(CH_2)_n$—, wherein R is C_1-C_{18} alkyl, X is —NH— or —O— and n is a value from 1 to 6.

4,294,577

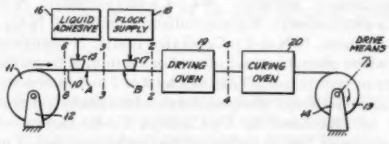
DYED FLOCKED FABRIC AND METHOD OF MAKING THE SAME

Leo N. Bernard, Plainfield, Conn., assignor to Pervel Industries, Inc., Plainfield, Conn.

Filed Mar. 25, 1980, Ser. No. 133,864

Int. Cl.[3] D06P *5/00, 7/00*

U.S. Cl. 8—488 40 Claims



1. The method of producing a dyed flocked fabric, which comprises selecting a suitable substrate fabric, coating the substrate fabric with a wet layer of flock adhesive, said adhesive having as an essential component thereof a selected heat-sublimable dye, selecting flock of a material capable of being dyed with a heat-sublimable dye, applying the selected flock to the wet coating of flock adhesive, drying the adhesive at a temperature less than that at which said dye sublimes, and then curing the adhesive by exposing the dried flocked substrate for a predetermined period of time to an elevated curing temperature at which said dye substantially fully sublimes.

4,294,578

COLORANTS

Friedrich W. Kröck, Cologne, and Rütger Neeff, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

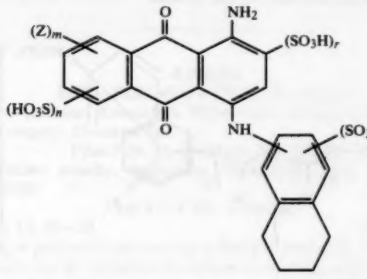
Filed Mar. 15, 1979, Ser. No. 20,867

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811718

Int. Cl.[3] D06P *3/04, 1/24*

U.S. Cl. 8—516 4 Claims

1. A polymeric material containing amide groups dyed with a dye which, in the form of the free acid, corresponds to the formula



in which

Z represents halogen or alkylcarbonylamino with 1-4 C atoms in the alkyl radical,

m is 0, 1 or 2 and n, r and s represent the numbers 0 or 1, with the proviso that the sum of n, r and s has a value of 1 or 2 and s can be 1 only if r at the same time is 0.

4,294,579

PROCESS FOR THE ONE-BATH, SINGLE-STAGE DYEING OR PRINTING OF CELLULOSE FIBRES WITH FIBRE-REACTIVE DISPERSE DYESTUFFS

Udo-Winifred Hendricks; Dietrich Hildebrand, both of Odenthal, and Robert Kuth, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 27, 1979, Ser. No. 69,690

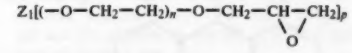
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914142

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.[3] D06P *3/66, 3/84*

U.S. Cl. 8—549 3 Claims

1. In the dyeing and printing of fibres and textile materials containing cellulose wherein the fibres or textile materials are contacted with a padding liquor or printing paste containing a water-insoluble reactive disperse dyestuff in the absence of alkali or alkaline compounds, the improvement which comprises incorporating in the padding liquor or printing paste at least one compound of the formula



wherein

Z_1 is a monovalent to tetravalent aliphatic hydrocarbon radical with 1-5 carbon atoms,

n is 0-10, and

p is 1-4.

4,294,580

REACTIVE DYESTUFFS, THEIR PREPARATION AND THEIR USE FOR DYEING MATERIALS CONTAINING OH OR N

Hermann Henk, Cologne; Klaus Wunderlich, Leverkusen, and Peter Wild, Alten Buseck, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

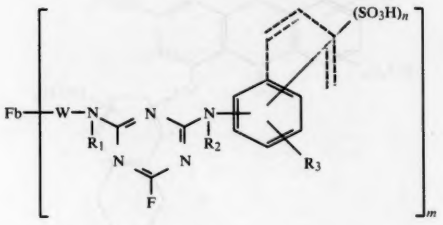
Filed Dec. 31, 1979, Ser. No. 108,307

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1979, 2901546

Int. Cl.[3] **C09B** *62/06*

U.S. Cl. 8—549 **9 Claims**

1. Reactive dyestuffs of the formula



wherein

Fb denotes the radical of an organic dyestuff,

W denotes a direct bond or a bridge member, W being bonded to a C atom of an aromatic-carbocyclic ring of the chromophor Fb,

R_1 denotes hydrogen, optionally substituted C_1–C_4-alkyl or aralkyl,

R_2 denotes C_2H_4—OH,

R_3 denotes hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, halogen, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkyl- or -dialkyl-aminocarbonyl, optionally substituted arylaminocarbonyl, sulpho, C_1–C_4-alkyl- or -dialkyl-aminosulphonyl, hydroxyl, optionally substituted C_1–C_4-alkyl- or aryl-carbonylamino, formylamino, oxalylamino, optionally substituted ureido or sulphomethylene,

n is 0, 1, 2 or 3 and

m is 1 or 2.

4,294,581

UNIFORMLY DYED WATER-SWELLABLE CELLULOSIC FIBERS

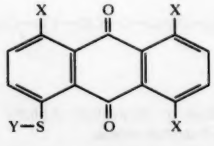
Siegfried Mensch; Gerhard Epple, Weisenheim, and Wolfgang Elser, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 94,893

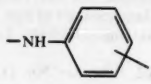
Int. Cl.[3] **C09B** *1/00, 1/56*

U.S. Cl. 8—611 **6 Claims**

1. Uniformly dyed water-swellable cellulosic fibers prepared by a process comprising: contacting water-swellable cellulosic fibers successively or simultaneously with water, with ethylene glycol, propylene glycol or a derivative thereof and, while the fibers are still swollen, with an essentially water-insoluble dye of the formula



where Y is phenyl which is unsubstituted, or is monosubstituted or disubstituted by C_1–C_4-alkyl, chlorine, bromine, nitro, cyano, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_2–C_3-alkyl, C_1–C_4-alkylsulfonyl, C_1–C_4-alkanoylamino or phenoxy, the substituents, in the case of disubstitution, being identical or different, or is α- or β-naphthyl, thiazol-2-yl, 4-(C_1–C_4-alkyl)-thiazol-2-yl, 4-phenylthiazol-2-yl, 4-(C_1–C_4-alkyl)-thiazolin-2-yl, 4-phenylthiazolin-2-yl, 5-amino-thiazol-2-yl, pyrazol-5-yl, imidazol-2-yl, 3-(C_1–C_4-alkyl)-imidazol-2-yl, 3-(C_1–C_4-alkyl)-1,2,4-triazol-5-yl, 2-phenyl-1,3,4-thiadiazol-5-yl, 2- or 5-thio-1,3,4-thiadiazol-5- or -2-yl, 3-phenyl-1,2,4-thiadiazol-5-yl, 2-(C_1–C_4-alkyl)-1,3,4-oxadiazol-5-yl, 2-phenyl-1,3,4-oxadiazol-5-yl, pyrid-2-yl, quinol-2-yl, quinazol-2-yl, quinazol-4-yl, benzimidazol-2-yl, 3-(C_1–C_4-alkyl)-benzimidazol-2-yl, benzoxazol-2-yl or benzthiazol-2-yl, two of the three radicals X being hydroxyl and the remaining radical being



where A is (a) saturated, linear or branched, C_1–C_{18}-alkyl; (b) C_2–C_8-alkyl substituted by cyano, chlorine, bromine, carbonyl-C_1–C_5-alkoxy, N-C_1–C_8-alkylcarbamyl, N,N-di-C_1–C_8-alkylcarbamyl, C_1–C_4-alkylsulfonyl, amino, di-C_1–C_4-alkylamino or phenoxy, the number of substituents being 1 or 2; (c) C_1–C_{10}-alkoxy, alkoxyalkoxy and alkoxyalkyl of a total of 3 to 11 carbon atoms; (d) hydroxyalkoxyalkyl of a total of 4 to 10 carbon atoms, and alkoxyalkoxyalkyl of a total of 5 to 11 carbon atoms; (e) phenoxyalkoxyalkyl, where the alkoxyalkyl radical is of a total of 4 to 6 carbon atoms; (f) saturated 5-, 6-, 7- or 8-membered cycloalkyl or polycycloalkyl of a total of 5 to 15 carbon atoms; (g) C_5–C_8-cycloalkyl which is unsubstituted or mono-, di- or tri-substituted by C_1–C_8-alkyl, cycloalkyl or hydroxyl; (h) phenyl-C_1–C_4-alkyl, where alkyl is unsubstituted or substituted by hydroxyl and phenyl is unsubstituted or substituted by C_1–C_{15}-alkyl; (i) phenyl which is unsubstituted or in which from 1 to 3 hydrogen atoms are replaced by C_1–C_{18}-alkyl, hydroxyl, chlorine, bromine, trifluoromethyl, nitro, cyano, C_1–C_5-alkoxy, C_1–C_4-alkylthio, C_1–C_5-alkanoylamino, sulfamyl, N-C_1–C_8-alkylsulfamyl, N,N-di-C_1–C_8-alkylsulfamyl, N-phenylsulfamyl, carbamyl, N-C_1–C_8-alkylcarbamyl, N,N-di-C_1–C_8-alkylcarbamyl, N-phenylcarbamyl, where phenyl is unsubstituted or substituted by methoxy, ethoxy or methyl, carbalkoxy of a total of 2 to 6 carbon atoms, C_1–C_4-alkylsulfonyl, phenylsulfonyl, where phenyl is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkylcarbonyl, phenalkoxy of 7 to 10 carbon atoms or phenoxy, and, if more than one substituent is present, these may be identical or different and, if more than one alkyl, alkoxy or alkyl and alkoxy is present, the sum of the carbon atoms in these substituents is at most 12; (j) cyano; (k) carbalkoxy of a total of 2 to 12 carbon atoms; (l) nitro; (m) N-C_1–C_8-alkylamino or N,N-(di-C_1–C_8-alkyl)-amino; (n) carbamyl, N-C_1–C_8-alkylcarbamyl or N,N-di-C_1–C_8-alkylcarbamyl; (o) alkanoylamino of 2 to 12 carbon atoms; (p) C_1–C_6-alkylsulfonyl; (q) sulfamyl, N-C_1–C_8-alkylsulfamyl or N,N-di-C_1–C_8-alkylsulfamyl; (r) azophenyl; (s) phenoxy which is unsubstituted or in which 1 or 2 hydrogens are replaced by chlorine or bromine, or (t) α- or β-naphthyl, and n is 0, 1 or 2.

4,294,582

METHOD FOR PROCESSING A BODY LIQUID SPECIMEN

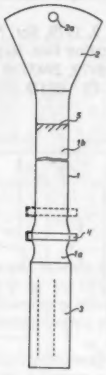
Jan I. Naslund, Vassvagen 21, Huddinge, Sweden

Continuation-in-part of Ser. No. 62,617, Aug. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 903,259, May 5, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,199

Claims priority, application Sweden, May 17, 1977, 7705788

Int. Cl.³ A61B *10/00*; G01N *1/10*

U.S. Cl. 23—230 B **2 Claims**



1. A method of processing a urine specimen for diagnostic examination, comprising the steps of:

introducing a fixative into the lower, closed end of an elongated tube formed of flexible material;

closing the tube with a first removable clip just above the portion containing the fixative;

introducing the urine specimen into the tube through a collapsible hopper which forms an open upper end of the tube and which funnels the urine down into said tube just above said removable clip;

permitting the urine specimen to separate, by settlement, to form a concentrate having a higher concentration of settled body cells than the rest of the urine specimen, and such that said concentrate is located adjacent the said removable clip;

applying a further removable clip across the first chamber of said tube to separate some or all of said concentrate from the remainder of the urine specimen therein;

removing said first removable clip to place said concentrate and said fixative into communication with each other to mix said concentrate with said fixative; and

removing the remainder of the urine specimen from said tube.

4,294,583

HIGHLY SENSITIVE GAS MEASURING METHOD FOR THE ANALYSIS OF BREATH ALCOHOL CONCENTRATIONS, USING TEST TUBES

Kurt Leichnitz, Grosse Grönau, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

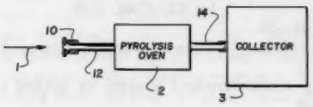
Filed Feb. 29, 1980, Ser. No. 125,978

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1979, 2912967

Int. Cl.³ G01N *31/12, 31/22*

U.S. Cl. 23—232 R **3 Claims**

1. A method of testing a person's breath for the purpose of determining its alcohol content as an indication of the ethyl alcohol in the person's blood of the type using a colorimetric carbon monoxide gas detector tube, comprising obtaining a sample of expiratory breathing air of the person, conducting the sample through a pyrolysis oven and operating the pyrolysis oven to decompose the alcohol and form carbon monoxide, collecting a predetermined quantity of the pyrolized sample,



and passing the collected quantity through the detector tube to determine the quantity of carbon monoxide as an indication of the alcohol content.

4,294,584

DEWATERING OF COAL SLURRIES

Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 10, 1980, Ser. No. 205,394

Claims priority, application Netherlands, Feb. 7, 1980, 8000750

Int. Cl.³ C10L *5/14, 5/22*

U.S. Cl. 44—23 **10 Claims**

1. A process for dewatering a slurry of coal particles and for producing strong pellets therefrom comprising agglomerating the coal particles with a hydrocarbon binder at an elevated temperture to obtain coal pellets, subjecting the pellets to heat treatment at a temperature of between 200° and 300° C., contacting gases released by the coal pellets during the heat treatment with the slurry to remove condensable components from the gases and to transfer heat to the slurry, and burning at least a part of the non-condensable gases to product heat for the heat treatment.

6. Apparatus for dewatering a slurry of coal particles and for producing strong pellets therefrom by agglomeration of the coal particles with a hydrocarbon binder at an elevated temperature comprising a slurry feed line, a pelletizer downstream of the slurry feed line, means for supplying binder to the pelletizer, mechanical dewatering means downstream of the pelletizer, heat treatment means downstream of the dewatering means, a recycle passageway for condensable and non-condensable gases from the heat treatment means to a scrubber situated in the slurry feed line upstream of the pelletizer, and means in the slurry feed line between the scrubber and the pelletizer for separating non-condensable gases from the slurry feed.

4,294,585

NOVEL FUEL COMPOSITION FOR INTERNAL COMBUSTION ENGINE

Rodney L. Sung, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 22, 1980, Ser. No. 189,530

Int. Cl.³ C10L *1/18, 1/22*

U.S. Cl. 44—53 **46 Claims**

1. A fuel composition for internal combustion engines comprising

(a) a major portion of a fuel containing (i) at least one alcohol selected from the group consisting of ethanol and methanol and (ii) gasoline in amount of 0–50 volumes per volume of alcohol; and

(b) a minor corrosion inhibiting amount of, as a corrosion inhibiting agent, a reaction product of (i) an aminotetrazole, (ii) a ketone or an aldehyde, and (iii) a C_3–C_{12} poly-primary amine bearing at least one free —NH_2 group and at least one —NHR′ group wherein R′ is a C_{12}–C_{18} hydrocarbon group.

4,294,586
GASOLINE AND DIESEL FUEL ADDITIVE

Charles P. Cox, Jr., 208 S. Sunnyside Rd., Decatur, Ill. 62522

Filed Jun. 5, 1980, Ser. No. 156,843
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—56 **18 Claims**

1. The process of making a fuel additive comprising the steps of:

placing a predetermined quantity of alcohol in a mixing vessel;

adding a predetermined quantity of toluene to said predetermined quantity of alcohol;

blending thoroughly the aforesaid quantities of substances by vigorous agitation of the mixing vessel;

adding a predetermined quantity of hydrogen peroxide; and then blending all together by further vigorous agitation of the mixing vessel.

4,294,587
MOTOR FUEL

Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 24, 1980, Ser. No. 200,366
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—74 **9 Claims**

1. An internal combustion fuel composition comprising a major proportion of a motor fuel containing a small but effective amount, sufficient to impart reduced knocking tendencies to said motor fuel, of an ashless antiknock additive selected from the group consisting of N-methallylaniline (I), N-allyl-o-toluidine (II), and N-crotyl-p-toluidine.

4,294,588
ELECTROSTATIC PRECIPITATOR EFFICIENCY ENHANCEMENT

David M. Polizzotti, Yardley, and Joe C. Steelhammer, Lansdale, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 140,287, Apr. 14, 1980, Pat. No. 4,239,504, which is a continuation-in-part of Ser. No. 29,414, Apr. 12, 1979, abandoned. This application Nov. 17, 1980, Ser. No. 207,173
Int. Cl.³ B03C *3/00*
U.S. Cl. 55—5 **37 Claims**

1. In an electrostatic precipitator, a method for removing particles from a particle-laden gas stream, which method comprises electrically charging the particles by passing the gas stream through an ionization field and attracting the thus-charged particles to a grounded collecting electrode for collection, the improvement comprising: prior to collection of the particles distributing across the gas stream within the ionization field from about 1 to 200 parts of an additive selected from the group of morpholine, morpholine compounds, and mixtures thereof per million parts of gas to enhance the efficiency of particle removal.

4,294,589
METHOD FOR REMOVING TRAPPED GAS UNDER POND LINERS

Richard E. Zachary, Clinton, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 22, 1977, Ser. No. 863,633
Int. Cl.³ B01D *53/00*
U.S. Cl. 55—36 **5 Claims**

1. A method for removing trapped gases under a liner in a lined pond adapted for storing liquids comprising:

(a) partially filling the pond excavation under the liner with a liquid thereby floating the liner on the liquid and collecting the trapped gases between the surface of the liquid and liner;

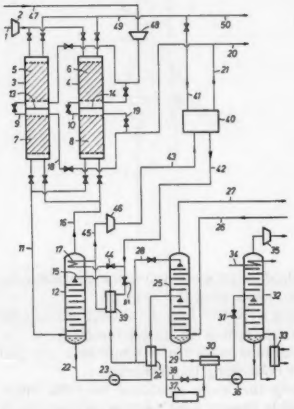
(b) Progressively filling the pond of top of the liner with another liquid thereby forcing the trapped gases beneath the liner to the sides of the pond and venting the gases up the sides of the pond to the atmosphere; and

(c) draining away the liquid under the liner thereby settling the liner onto the bottom of the pond excavation.

4,294,590
REMOVAL OF UNDESIRED GASEOUS COMPONENTS FROM HOT WASTE GASES

Gerhard Linde, Gruenwald; Peter Haeussinger, Munich, and Claus Schliebener, Strasslach, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 9, 1979, Ser. No. 93,089
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1978, 2848721; Oct. 25, 1979, 2943130
Int. Cl.³ B01D *53/14*
U.S. Cl. 55—48 **28 Claims**



1. In a process for removing undesired gaseous components from hot combustion gases by scrubbing with a regenerable absorbent,

the improvement which comprises:

conducting the scrubbing with a liquid physical absorbent at a temperature less than 0° C. and supplying cooling requirements of the scrubbing process by means of an absorption-type refrigeration unit, cooling the combustion gases prior to scrubbing, in indirect heat exchange with gas streams to be heated, the indirect heat exchange being performed in an upper temperature range and a subsequent lower temperature range and using air as said gas stream to be heated in the upper temperature range of the indirect heat exchange, resultant heated air being used in part as (a) preheated air of combustion and in part as (b) an energy source for the operation of the absorption-type refrigeration unit.

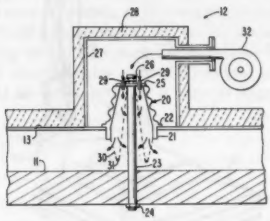
4,294,591
MOUNTING FOR HIGH-VOLTAGE ELECTRODE SUPPORT FRAME IN AN ELECTROSTATIC PRECIPITATOR

Melvin R. Kahl, Richland, Pa., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed May 12, 1980, Ser. No. 148,845
Int. Cl.³ B03C *3/70, 3/41*; H01B *17/54, 17/52*
U.S. Cl. 55—120 **9 Claims**

1. In an electrostatic precipitator having a housing with an opening formed therein and a mounting assembly suspending an electrically conductive support frame for a high-voltage electrode in the electrostatic precipitator, said mounting assembly comprising:

(a) an electrical insulator having a bore therethrough, said insulator being secured to said housing of the precipitator circumjacent the opening therein;
(b) a substantially gas-tight housing portion, stationed on said housing over said opening, said housing portion enclosing said insulator;
(c) fastening means for securing said support frame to said insulator, said fastening means including:
(i) an elongate portion affixed to said support frame and extending upward through said opening and through said insulator bore, and
(ii) a connecting portion extending outward from said



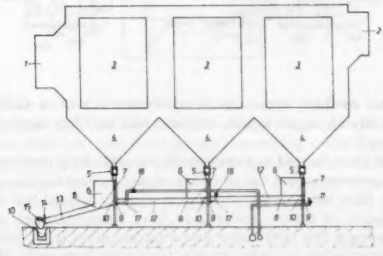
elongate portion and bearing against said insulator, said connecting portion having inlet ports for permitting gas flow from said housing portion into said bore;
(d) means for introducing heated gas into said housing portion; and
(e) a porous fabric skirt positioned in said insulator bore so that heated gas flowing from said housing portion into said insulator bore passes through said porous fabric skirt as it enters into said precipitator, said skirt being mechanically fastened to said connecting portion and to a bottom portion of said insulator to prevent direct exposure of the bore of the insulator to particulate-laden gas within the precipitator housing.

4,294,592

APPARATUS FOR THE HYDRAULIC TRANSPORT OF PRECIPITATOR DUST

Horst Buchmüller, Hünxe, and Bernhard Michelbrink, Wesel, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,653
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926330
Int. Cl.³ B03C *3/00*
U.S. Cl. 55—120 **5 Claims**



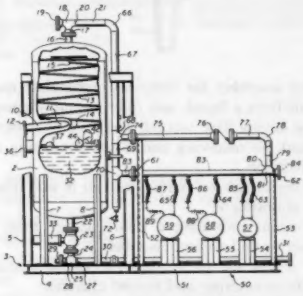
1. Apparatus for precipitating dust and the hydraulic transport of precipitator dust from a precipitator plant, comprising precipitator cells; a plurality of hoppers consecutively arranged in flow direction of gas to be cleaned by said precipitator cells; discharge means connected to said hoppers; a sluice chamber for each hopper and connected to said discharge means underneath said hoppers, said sluice chamber having an inlet for rinse water and an outlet for a mixture of rinse water and precipitator dust; the outlet of the sluice chamber of the rear hopper in gas flow direction being connected with the inlet of the sluice chamber of the preceding hopper by one sluiceway each, only the sluice chamber of the last hopper being supplied with fresh rinse water; each chamber having only a single source of rinse water, the sluice chamber of the last hopper having an outlet connected to an inlet of its immediately preceding sluice chamber so that said latter chamber is rinsed with water already containing filtered dust; said latter chamber having an outlet connected to the input of its own immediately preceding chamber so that the rinse water flows thereby in sequence through all sluice chambers located below the individual hoppers, the rinse water becoming increasingly laden with dust in its flow direction, the flow direction of the rinse water being opposite to the flow direction of the gas to be cleaned.

4,294,593

DRILLING MUD DEGASSER APPARATUS AND SYSTEM

William A. Rehm, 1726 Augusta, Suite 113, Houston, Tex. 77057

Filed May 2, 1980, Ser. No. 145,895
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—166 **15 Claims**



1. A drilling mud degasser system comprising
a tank having an inlet for drilling mud and an overhead outlet for removal of gas and a bottom outlet for removal of degassed mud,
a plurality of blowers operatively connected to said overhead outlet for evacuating the same to remove gas from drilling mud therein,
pressure operated switch means operable to energize said blowers successively upon occurence of a predetermined pressure on the inlet side of said blowers, and
thermostatic switch means responsive to gas temperature on the outlet sides of said blowers and operable upon occurence of a predetermined temperature to deenergize at least one of said blowers.

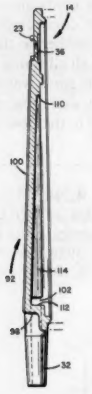
15. A drilling mud degasser tank comprising
a hollow enclosed tank having
a side inlet for receiving drilling mud,
a top outlet for removal of gas, and
a bottom outlet for removal of degassed drilling mud,
a helical shelf supported inside the wall of said tank having the bottom end thereof adjacent to said side inlet to receive drilling mud thereon and spiralling upward along the tank wall so that mud moving along said shelf may fall as a thin sheet or film into the interior of the tank, thus facilitating removal of gas therefrom, and
said helical shelf narrower at its bottom end than at its top end and tapering outward from bottom to top along its helical length.

4,294,594

SELF-CONTAINED FILTER ASSEMBLY FOR REMOVING AIR, PARTICLES AND BACTERIA FROM A SOLUTION

Thomas E. Sloane, Jr., West Redding; Clair Melius, Southport, both of Conn., and Erich Kling, Carmel, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 2, 1979, Ser. No. 81,185
Int. Cl.³ B01D *25/00, 53/22*
U.S. Cl. 55—186 **15 Claims**



1. A filter assembly for removing particulate matter, bacteria, and air from a liquid, said filter assembly comprising:
a housing having first, second, and third chambers;
inlet means for receiving said liquid containing air in said first chamber;
first venting means for venting said air in said first chamber to the atmosphere;
passage means providing a fluid passage from said first chamber to said second chamber;
prefilter means for preventing particulate matter in said liquid from entering said second chamber;
second venting means for venting to the atmosphere the air entering said second chamber;
means providing a fluid passage from said second chamber to said third chamber;
bacteria filtering means for preventing air and bacteria in said second chamber from entering said third chamber; and
outlet means for providing an exit for the liquid in said third chamber.

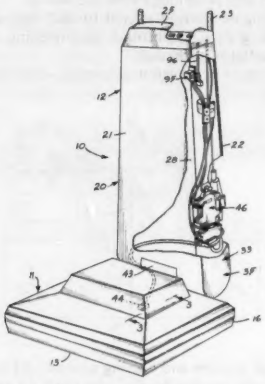
4,294,595

VACUUM CLEANER INCLUDING AUTOMATIC SHUTOFF DEVICE

Leonard E. Bowerman, Fairfield, Conn., assignor to Electrolux Corporation, Old Greenwich, Conn.

Filed Jul. 18, 1980, Ser. No. 170,244
Int. Cl.³ B01D *46/46;* **A47L** *9/12*
U.S. Cl. 55—213 **7 Claims**

1. In a vacuum cleaner having a motor, a nozzle intake, dirty air passageways extending from the nozzle intake to a filter, a housing for the filter, and a door in the housing for access to the filter, a fan operably connected to the motor to draw air through the dirty air passageways and the filter, and a clean air passageway extending between the filter and the fan, the improvement comprising:
means for sensing the differential pressure between the dirty air passageways at a first point ajacent the nozzle intake and at a second point along the clean air passageway,
a first switch means responsive to a predetermined change in the differential pressure due to clogging of the dirty air passageways or a full filter,
relay means normally electrically connecting said first switch means and the motor, said relay means being activated in response to said first switch means to interrupt power to the motor until said relay is reset,



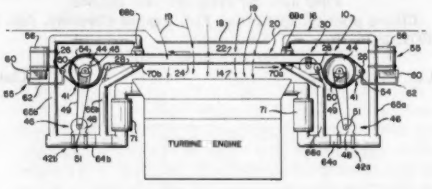
a second switch means operatively connected through said relay means to interrupt power to the motor in response to the absence of the filter in the filter housing,
and a bypass valve means selectively connecting said sensing means to atmosphere for defeating the operation of said pressure differential sensing means to thereby permit an auxiliary cleaning tool to be operatively connected along the dirty air passageway.

4,294,596

AIR-FILTER APPARATUS IN COMBINATION WITH A TURBINE ENGINE

Dan Taverez, 17375 Brookhurst, No. 46, Fountain Valley, Calif. 92644

Filed Apr. 25, 1980, Ser. No. 143,880
Int. Cl.³ B01D *45/10, 46/04, 46/22*
U.S. Cl. 55—242 **3 Claims**



1. An air-filter apparatus in combination with a turbine engine having an air intake, wherein said air-filter apparatus comprises:
an air filter formed as a continuous movable loop positioned transversely over the air intake of said turbine engine, said air filter being defined by a continuously formed belt-like blanket of fibrous material to filter foreign matter, and having a first outer layer and a second inner layer which continuously move in opposite directions from each other longitudinally;
means for movably supporting said looped air filter, whereby said air filter moves longitudinally about said support means, said support means including rotatable support spindle guides and tension spindles;
a first drive means positioned and arranged to drive said air filter;

a pair of rotating brushes, each brush being positioned within respective looped ends of said air filter to engage said first and second layers thereof;

brush-drive means attached to said brushes to rotate said brushes at a speed less or greater than the longitudinal movement of said air filter;

means for applying a cleaning fluid to said air filter, which comprises a plurality of holes formed in said support spindle guides, to supply the cleaning fluid directly to said air filter and a reservoir having a pump interconnected to said support spindle guides, to provide cleaning fluid to said support rollers as said air filter moves thereon;

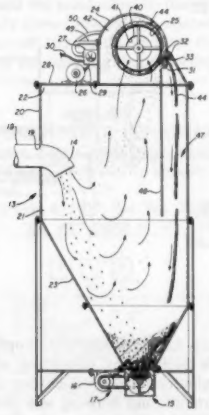
a pair of vacuum systems, each being positioned on opposite sides of said turbine engine and having vacuum means for removing said foreign matter from said air filter, and said vacuum systems being connected to said air intake such that said air intake provides a vacuum source.

4,294,597

LINT COLLECTING SYSTEM AND APPARATUS

Ronald J. Archer, 3414 Brookglen, Garland, Tex. 75042, and Richard V. Fetterly, 12801 Champion Forest Dr., Houston, Tex. 77066

Filed Mar. 17, 1980, Ser. No. 131,280
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—283 **9 Claims**



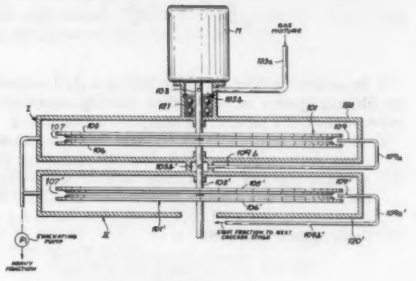
1. In an air cleaning system having a rotary filter means and bin structure: said bin structure comprising, a bin with a plenum chamber; said filter means comprising roller filter means mounted in the top of said bin plenum chamber; doffer roller means for removing bat deposited on said roller filter means; air flow system means for delivery of particle laden air to said bin plenum chamber, and developing a pressure differential across from a first side to a second side of said roller filter means and for exhausting air from the second side of said roller filter means and from said bin; barrier wall means within said bin extending down from said doffer roller means through a substantial vertical distance within said bin to provide a still chamber generally separate from said plenum chamber, with bat removed from said roller filter means falling through said still chamber to the bottom of said bin and air lock means for removing deposited material from bottom of said bin.

4,294,598

APPARATUS FOR THE SEPARATION OF GAS MIXTURES, PARTICULARLY THE ENRICHMENT OF A GAS MIXTURE IN A COMPONENT CONTAINING URANIUM 235

Hans O. E. Gazda, Anton-Krieger-Gasse 155, A-1238 Wien, Austria

Division of Ser. No. 889,395, Mar. 23, 1978, Pat. No. 4,225,324.
This application Jul. 19, 1979, Ser. No. 59,055
Claims priority, application Austria, Mar. 24, 1977, 2076/77
Int. Cl.³ B01D *45/14*
U.S. Cl. 55—403 **5 Claims**



1. An apparatus for separating a light component from a heavy component in a gas mixture, said apparatus comprising:

a housing; a shaft rotatable about an upright axis; and extending into said housing;

a motor operatively connected to said shaft for rotating same;

a plurality of axially spaced centrifuge disks positioned in said housing and mounted on said shaft and rotatable therewith, each of said disks being formed with a radial passage extending from a central portion of the respective disk outwardly and opening into a peripheral compartment of greater axial width than the passage at the outer periphery of the respective disk;

means for feeding said gas mixture centrally to a first of said disks for acceleration outwardly through its radial passage whereby a turbulent flow is formed along the peripheral compartment of said first of said disks;

means in said housing for recovering a light component from said mixture through the passage of said first of said disks and including a duct reaching into said boundary layer from said housing at a location thereon radially outwardly of said one of said disks;

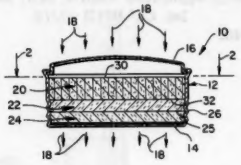
means for feeding the light component collected from the boundary layer of said first of said disks and supplying it centrally to a second of said disks for acceleration through the passage of said second of said disks whereby another boundary layer is maintained adjacent the periphery of said second of said disks by the interaction of the accelerated light component in said second of said disks and the surrounding body of gas retained by the respective compartment of said housing; and

a further duct reaching radially from said housing into said boundary layer of said second of said disks to collect a light component therefrom whereby said disks are connected in cascade for multistage recovery of said light component from said mixture.

4,294,599
AEROSOL FILTER CARTRIDGE

William R. Grovesteen, Southbridge, and John A. Jones, Wilbraham, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Feb. 19, 1980, Ser. No. 122,206
Int. Cl.[3] B01D *50/00, 46/12*
U.S. Cl. 55—485 6 Claims



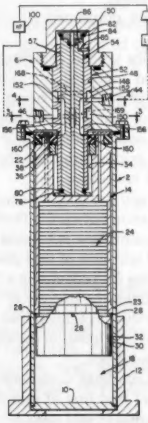
1. In an aerosol filter cartridge having a shell containing an air filtering system including final filtering components, the improvement of a prefiltering component comprising:

an elongated mat of glass fibers, said mat being closely spiraled with opposite edges thereof providing opposite air-receiving and air-emitting faces of said component, one of said faces being adjacent to said final filtering components and a side of said spiraled mat being closely fitted against said shell.

4,294,600
VALVES FOR CRYOGENIC REFRIGERATORS

Domenico S. Sarcia, Carlisle, Mass., and Calvin K. Lam, Bedford, N.H., assignors to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.

Filed Oct. 29, 1979, Ser. No. 89,272
Int. Cl.[3] F25B *9/00*
U.S. Cl. 62—6 29 Claims



19. A cryogenic refrigerator comprising:

cylinder means;

displacer means movable within the cylinder means according to a four step sequence wherein it (a) dwells in an uppermost position, (b) moves downwardly, (c) dwells in a lowermost position and (d) moves upwardly again;

first and second chambers the volumes of which are defined by movement of the displacer means,

conduit means connecting said first and second chambers,

thermal storage means associated with said conduit means,

supply reservoir means for supplying high pressure fluid;

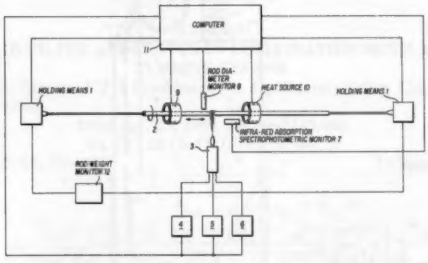
exhaust reservoir means for receiving low pressure fluid; and

refrigerator regulating valve means associated with the supply and exhaust reservoir means for causing high pressure fluid to enter the first chamber and the conduit means during the first-mentioned and second-mentioned steps of the displacer means motion and to exhaust low-pressure fluid during the third and fourth steps of the displacer means motion, said valve means comprising a valve casing fixed with respect to the cylinder means and a valve member slidable relative to the casing, the casing having one or more pairs of diametrically opposed inlet ports communicating with said supply reservoir means and one or more pairs of diametrically opposed outlet ports communicating with said exhaust reservoir means, said valve casing and valve member also having cooperating means for alternately connecting said first chamber to said inlet or outlet ports according to the movement of the valve member between two limit positions, and cooperating means on the displacer means and valve member for (a) causing the valve member to be in one of its limit positions and the displacer means to be in its uppermost position concurrently, and (b) causing the valve member to be in its other limit position and the displacer means to be in its lowermost position concurrently.

4,294,601
APPARATUS AND PROCESS FOR AUTOMATIC CONTROL OF THE PRODUCTION OF OPTICAL FIBER

Franklin W. Dabby, Woodbridge, and Ronald B. Chesler, Cheshire, both of Conn., assignors to Times Fiber Communications, Inc., Wallingford, Conn.

Filed Jul. 13, 1979, Ser. No. 57,501
Int. Cl.[3] C03B *37/025, 37/07, 37/075*
U.S. Cl. 65—3.12 19 Claims



16. In a process for the production of optical fiber comprising preparing a preform by depositing and sintering glass particles on a cylindrical glass rod, heating said preform to the drawing temperature, and drawing said preform into optical fiber, the improvement comprising continuously monitoring the diameter of the glass rod during deposition of the glass particles and adjusting the composition of said particles in response to the diameter measurement such that the particles are uniformly distributed across the length of the rod at the appropriate composition for a given radial distance from the rod axis.

4,294,602
ELECTRO-OPTICALLY ASSISTED BONDING

William E. Horne, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 9, 1979, Ser. No. 64,994
Int. Cl.[3] C03C *27/00*
U.S. Cl. 65—40 12 Claims

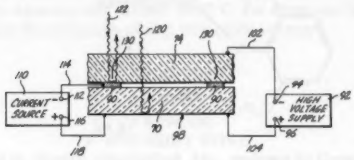
1. A method of integrally bonding a cover glass to a surface of a semicondutor cell having conductors thereon, comprising the steps of:

providing a semiconductor cell and a cover glass having a desired ratio of energy absorptions at a certain wavelength;

juxtaposing the cover glass and the semiconductor cell, the conductors spacing apart the cover glass and the semiconductor cell;

applying a predetermined electrostatically-bonding high voltage between the outer surfaces of the juxtaposed cover glass and the semiconductor cell;

pre-heating the juxtaposed cover glass and the semiconductor cell to a first temperature sufficient to promote ion drift in the cover glass and to establish an electrostatic field between the cover glass and the cell; and



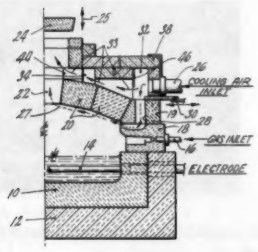
irradiating the juxtaposed cover glass and the semiconductor cell with a pulsed beam of electromagnetic energy at the certain wavelength on a path substantially normal to said cover glass to heat the juxtaposed cover glass and the silicon cell to a second temperature higher than the first temperature except in those regions above the conductors which are heated to a third temperature higher than the second temperature due to reflection back into said cover glass of the pulsed beam by the conductors, the third temperature sufficient to enable the cover glass to soften and flow around the conductors so that the cover glass is electrostatically drawn toward the adjacent surface of the semiconductor cell to bond the surfaces thereof along substantially all of the interface therebetween.

4,294,603

GLASS FOREHEARTH CONSTRUCTION

Frederick W. Winzer, East Granby, and James R. Ault, New Britian, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 4, 1979, Ser. No. 71,923
Int. Cl.³ C03B 5/16
U.S. Cl. 65—346 **1 Claim**



1. A molten glass forehearth comprising an elongated channel for constraining the flow of molten glass, a roof structure for said channel and including side blocks of heat conductive refractory material supported on the channel sides, said roof structure including arch blocks also of heat conductive refractory material supported on said side blocks, said roof structure defining top openings at longitudinally spaced locations in the forehearth, closure blocks supported in spaced relationship above said top openings, roof superstructure means supported by said side blocks and said arch blocks, said roof superstructure means including a plurality of longitudinally spaced blocks defining transverse muffled cooling air passageways therebetween, a source of cooling air communicating with the outer ends of said muffled cooling air passageways, inner ends of said muffled cooling air passageways communicating with said top openings, said roof superstructure further including insulating bricks supported by said longitudinally spaced blocks to provide for substantial heat transfer from said refractory brick roof structure to the cooling air flowing in said muffled cooling air passageways, said refractory blocks of said roof structure defining direct cooling air passages having inner ends communicating with the interior of said forehearth channel to direct air along the interior of the arch blocks toward said top openings, and outer ends of said direct cooling air passageways communicating with a plenum defined by said roof superstructure insulating bricks, said plenum also communicating with said transverse muffled cooling air passageways and with said source of cooling air, and means for selectively closing said direct cooling air passageways.

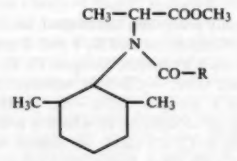
4,294,604

USE OF SELECTED N-(2,6-DIMETHYLPHENYL)-ALANINE METHYL ESTER COMPOUNDS AS AMMONIUM NITRIFICATION COMPOUNDS

Thomas O. Evrard, Little Rock, Ark., assignor to Olin Corporation, New Haven, Conn.

Filed Feb. 25, 1980, Ser. No. 124,185
Int. Cl.³ C05C 11/00
U.S. Cl. 71—27 **12 Claims**

1. A method for inhibiting the nitrification of ammonium-nitrogen in soil which comprises treating the soil with an effective nitrification-inhibiting amount of at least one of the nitrification-inhibiting compounds having the formula:



wherein R is selected from the group consisting of:

and $-CH_2OCH_3$.

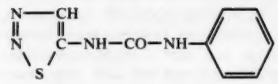
4,294,605

AGENTS FOR THE DEFOLIATION OF PLANTS

Friedrich Arndt; Reinhard Rusch, and Heinz Schulz, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 651,522, Jan. 22, 1976, abandoned. This application Nov. 21, 1979, Ser. No. 96,577
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1975, 2506690
Int. Cl.³ A01N 43/82
U.S. Cl. 71—73 **3 Claims**

1. Method for defoliating cotton plants, comprising applying to the plants N-phenyl-N¹-1,2,3-thiadiazol-5-yl urea of the formula



in mixture with liquid or solid carriers.

4,294,606

NOVEL N-PHENYL-SUBSTITUTED N-HETEROCYCLIC COMPOUNDS, THEIR PREPARATION AND USE IN AGENTS FOR REGULATING PLANT GROWTH

Hans Tobler, Allschwil; Werner Föry, Basel, and Rolf Schurter, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

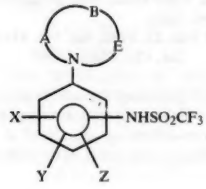
Division of Ser. No. 896,970, Apr. 12, 1978, Pat. No. 4,208,202. This application Jan. 14, 1980, Ser. No. 111,552

Claims priority, application Switzerland, Apr. 15, 1977, 4702/77; Nov. 9, 1977, 13661/77

Int. Cl.[3] **A01N** *43/40;* **C07D** *295/12;* **A01N** *43/36, 43/46*

U.S. Cl. 71—88 **13 Claims**

1. A compound of the formula



or a physiologically acceptable salt thereof, in which A + B + E together are C_3–C_6 alkylene, and X, Y and Z independently of one another are each hydrogen, halogen, C_1–C_4 alkyl or halogenoalkyl, cyano, nitro, —CS-NH_2, substituted or unsubstituted benzyl or a group —$S(O)_n$—R_6, —OR_7, —$COOR_8$, —SO_2—$N(R_{10})_2$ or —$N(R_{11})_2$, in which n is a number from nought to 2, R_6 is C_1–C_5 alkyl, or phenyl or phenylalkyl (C_1–C_5), R_7 is C_1–C_5 alkyl, lower alkoxyalkyl, lower alkoxyalkoxyalkyl, lower alk(en)ylcarbonyl, phenyl or benzoyl which can be substituted by lower alkyl, halogen, CN, CF_3 or NO_2, R_8 is hydrogen or lower alkyl, R_{10} is C_1–C_4 alkyl and R_{11} is hydrogen or C_1–C_4 alkyl.

11. An composition for regulating plant growth which contains, in addition to carrier materials, at least one trifluoromethanesulphonamido-phenyl-substituted heterocyclic compound according to claim **1** as the active component.

4,294,607

HERBICIDAL COMPOSITIONS

Robert R. Schmidt, Cologne, and Rudolf Thomas, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 10, 1979, Ser. No. 73,982

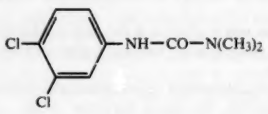
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842003

Int. Cl.[3] **A01N** *43/56, 47/30*

U.S. Cl. 71—92 **13 Claims**

1. Herbicidal composition containing a total of 0.1 to 95% by weight as active ingredients

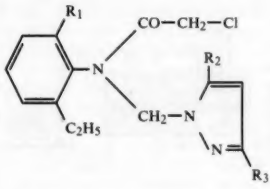
(1) 3-(3,4-dichlorophenyl)-1,1-dimethylurea, of the formula



(I),

and

(2) at least one N-substituted haloacetanilide compound of the formula



(II),

wherein

R^1 is methyl or ethyl;

R^2 is hydrogen or methyl; and

R^3 is hydrogen or methyl.

in a ratio of between 1:0.5 to 1:5 by weight compound (I):(II).

4,294,608

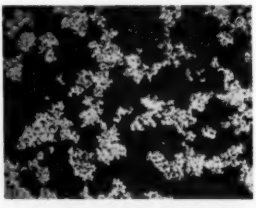
CATALYTIC ALLOYS

John M. Sedlak, Andover, Mass., and Richard J. Lawrance, Hampstead, N.H., assignors to General Electric Company, Wilmington, Mass.

Filed Mar. 27, 1980, Ser. No. 134,853

Int. Cl.[3] **C22B** *61/00*

U.S. Cl. 75—0.5 A **21 Claims**



1. A method of making a finely-divided metal alloy comprising the steps of:

(a) mixing in aqueous solution the water-soluble salts of at least two metals and a first reducing agent in an amount and under conditions insufficient to reduce the metal salts in solution;

(b) adding the aqueous solution of metal salts containing the first reducing agent to a caustic solution of a second reducing agent present in an amount sufficient to cause the reduction of the dissolved metal salts at elevated temperatures, whereby a precipitate of alloy of the metals in the metal salts forms in the solution; and

(c) separating the precipitate from the solution.

4,294,609

PROCESS FOR THE REDUCTION OF IRON OXIDE

Stefano Taricco, Turin, Italy, assignor to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed May 15, 1980, Ser. No. 150,113
Claims priority, application Italy, Jun. 25, 1979, 68346 A/79
Int. Cl.[3] C21B *13/14*
U.S. Cl. 75—34 5 Claims

1. A process for the reduction of particulate iron oxide, wherein said iron oxide is heated continuously in an atmosphere of reducing gas as the sole reducing agent at a temperature between 600° C. and 650° C. for about one hour to convert the particles of said iron oxide to a porous form which allows thorough penetration by said reducing gas and than at a temperature between 900° C. and 1100° C. for about one hour to complete the reduction of said iron oxide to iron.

4,294,610

FOUNDRY COKE

Edward D. Burton, Chesterfield, Mo., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Continuation of Ser. No. 896,579, Apr. 14, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,547
Int. Cl.[3] C04B *7/02*
U.S. Cl. 75—43 9 Claims

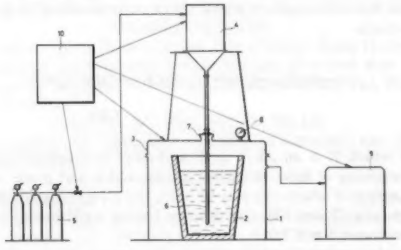
1. A coke suitable for use as fuel in a foundry cupola to produce gray iron, said coke containing uniformly distributed throughout its structure from 0.5 to 2.5% by wt. of silicon carbide effective to act as a deoxidizer and inoculant during the melting of said gray iron and which is blended with the coal used to produce said coke prior to coking said coal.

4,294,611

PROCESS AND APPARATUS FOR REDUCING THE INCLUSION CONTENT OF STEELS AND FOR REFINING THEIR STRUCTURE

Istvan Tamas; Lajos Tamas; Gyula Kiss; Jozsef Kiss, and Antal Kaldor, all of Budapest, Hungary, assignors to Vasipari Kutató Intézet, Budapest, Hungary

Filed Oct. 3, 1979, Ser. No. 81,350
Claims priority, application Hungary, Oct. 4, 1978, VA 1535
Int. Cl.[3] C21C *7/10*
U.S. Cl. 75—49 2 Claims



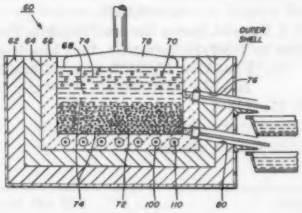
1. A process for reducing the inclusion content of steels and refining their structure which comprises the steps of subjecting molten steel containing inclusions to a pressure about 2 to 6 atms; removing inclusions from the molten steel by injecting therein at said pressure through a blast lance by means of an inert gas an inclusion-removing alloy containing calcium or magnesion; and thereafter applying a vacuum of 10^{-3} to 10 Torr to the molten steel to evaporate residual calcium or magnesium from the steel.

4,294,612

FRACTIONAL CRYSTALLIZATION PROCESS

Robert K. Dawless, Monroeville, and Robert E. Graziano, Arnold, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 973,138, Dec. 26, 1978, Pat. No. 4,221,590. This application Nov. 30, 1979, Ser. No. 98,736
Int. Cl.[3] C22B *21/02*
U.S. Cl. 75—68 R 4 Claims



1. An improved method for purifying impure aluminum by fractional crystallization comprising the steps of:

(a) providing an open topped vessel for retention of molten aluminum, the vessel having sidewalls and a bottom which are comprised of an outer shell and a multilayered lining which is used for purposes of containing the molten aluminum, the lining having

(i) an outer insulating layer adjacent said shell;

(ii) an intermediate layer of powdered alumina; and

(iii) an inner layer of high purity refractory being at least 90 wt.% alumina and being sintered in place from a powder form to provide a monolithic lining resistant to penetration by molten aluminum and thereby providing the aluminum with substantial freedom from contamination;

(b) providing a body of impure aluminum in a molten state in the vessel for purposes of purification;

(c) removing heat at the surface of the body of impure aluminum for purposes of removing eutectic impurities therefrom by forming aluminum crystals therein, said crystals having a higher purity than the remaining liquid aluminum constituting the remaining fraction having impurities concentrated therein, the crystals being displaced away from the heat removing surface, a portion of the crystals collecting in a bed adjacent the bottom of the vessel; and

(d) introducing heat to the body adjacent the bottom thereof for purposes of melting a portion of the crystals collected adjacent the bottom of the vessel using heating elements which are protected from molten aluminum by said monolithic lining, and the melted portion is moved through the crystals by action of crystals being displaced away from the heat removing surface and whereby the melted portion carries impurities towards the upper part of the body.

4,294,613

ACID RESISTANT, HIGH-STRENGTH STEEL SUITABLE FOR POLISHING

Henrik Giflo, III Ujitok u.5, 3532 Miskolc, Hungary

Filed Jul. 3, 1979, Ser. No. 54,526
Int. Cl.[3] C22C *38/06*
U.S. Cl. 75—124 4 Claims

1. A high strength steel, suitable for polishing and acid-resistant cohesion, consisting essentially of, besides iron and the usual residual elements, 0.04 to 2% (by weight) of C, 0.1 to 1% (by weight) of Si, 0.1 to 5% (by weight) of Mn, at least 5% (by weight) of Cr, at most 12% (by weight) of Ni, 0.01 to 4% (by weight) of Cu, 0.05 to 3% (by weight) of Mo, 0.005 to 0.6% (by weight) of N, 0.005 to 0.25% (by weight) of Zr or Be or their mixture, 0.001 to 0.2% (by weight) of Al, 0.04 to 1.5% (by weight) of Nb or V or their mixture, 0.001 to 0.01% (by

weight) of Ca and at least 0.001 (by weight) of B or Ce or their mixture.

4,294,614

AUSTENITIC IRON-BASE CRYOGENIC ALLOY AND ARC WELDING ELECTRODE FOR DEPOSITING THE SAME

Damian J. Kotecki, Spring Garden Township, York County, Pa., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Oct. 17, 1979, Ser. No. 85,471
Int. Cl.³ C22C *39/54, 38/04, 38/44*
U.S. Cl. 75—128 A **4 Claims**

1. An austenitic iron-base cryogenic alloy consisting essentially of, in weight percent,

Carbon	0.05 min. to 0.20 max.
Manganese	3.5 to 7.0
Silicon	0.75 max.
Chromium	13.0 to 17.0
Nickel	14.0 min.
Molybdenum	1 to 3
Iron plus unavoidable impurities	Balance,

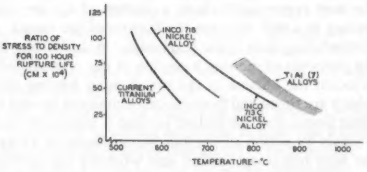
and containing no more than 2FN delta ferrite, said alloy displaying at least 15 mils lateral expansion when impact tested by the Charpy V-notch test at −320° F.

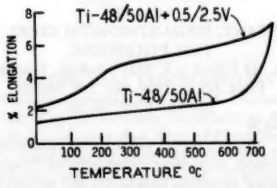
4,294,615

TITANIUM ALLOYS OF THE TIAL TYPE

Martin J. Blackburn, Kensington, and Michael P. Smith, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 25, 1979, Ser. No. 60,265
Int. Cl.³ C22C *14/00*; C21D *1/00*
U.S. Cl. 75—175.5 **6 Claims**


RATIO OF STRESS TO DENSITY FOR 100 HOUR RUPTURE LIFE (CM X 10⁴)
INCO 718 NICKEL ALLOY
CURRENT TITANIUM ALLOYS
Ti Al (7) ALLOYS
INCO 713 NICKEL ALLOY
TEMPERATURE - °C



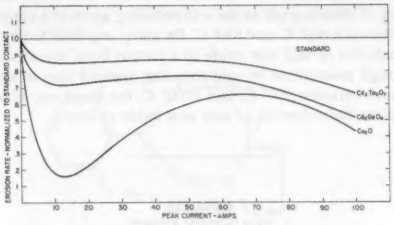
1. A cast and forged titanium alloy with ductility at room temperature and good high temperature strength, consisting essentially of by weight percent 31–36 aluminum, 0.1–4 vanadium, balance titanium (in atomic percent, about: 45–50Al, 0.1V, bal Ti).

4,294,616

ELECTRICAL CONTACTS

Han J. Kim, Greensburg, Pa.; Thomas E. Peters, Chelmsford, and John Gustafson, Harvard, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jan. 2, 1979, Ser. No. 628
Int. Cl.³ H01H *1/02*
U.S. Cl. 75—234 **5 Claims**



1. An electrical contact having a working surface consisting essentially of from about 50 to about 95 percent by weight silver or silver alloy, from about 5 to about 50 percent by weight of cadmium oxide, and an additional oxide selected from the oxides of germanium, tantalum, and mixtures thereof, said additional oxide being present in an effective amount sufficient to reduce the surface energy between said working surface and the liquid phase of said silver and being substantially homogeneously distributed on said surface in a silver matrix.

4,294,617

COMPOSITIONS AND METHODS FOR THE DENATURATION OF WATER-BASE PAINTS

Philippe Schlicklin, Nancy; Anne-Marie Mertzweiller nee Maillard, Maidieres, and Jacques Ploussard, Pont a Mousson, all of France, assignors to Air Industrie, France

Continuation of Ser. No. 938,909, Sep. 1, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 141,796
Claims priority, application France, Sep. 6, 1977, 77 26948
Int. Cl.³ C09D *5/08*
U.S. Cl. 106—14.37 **9 Claims**

1. Method for the denaturation of water-base paints, characterized in that the paint is contacted with and dispersed in a solution containing between 1.5 to 10 g/l of at least one sulphate of iron (II), of magnesium or of manganese and at least one non-ionic surface active agent corresponding to general formula

$$R-O(CH_2-CH_2-O)_n-(CH_2-\underset{CH_3}{CH}-O)_p-H$$

in which R is an alkyl, aryl, aryl-alkyl or alkyl-aryl group, containing at least 10 carbon atoms, and n and p are whole numbers of which one may be zero, and n+p being comprised between 12 and 100, said solution having a pH during use of between 6.5 and 8.0.

4,294,618

SILICA-DOPED, CHROME-ALUMINA MONOLITHIC REFRACTORY COMPOSITIONS

Henry E. Anthonis, Annapolis, Md., assignor to General Refractories Company, Bala Cynwyd, Pa.

Filed May 27, 1980, Ser. No. 152,992
Int. Cl.³ C04B *35/10, 35/12*
U.S. Cl. 501—129 **8 Claims**

1. A monolithic refractory composition comprising:
from about 63% to 90% by weight high purity Al_2O_3;

from about −2–8% by weight free crystalline silica having a particle size of −200 mesh;
from about 2–6% by weight high purity of Cr_2O_3;
from about 1–8% by weight high purity kaolin clay having a particle size of −10μ (micron); and
from about 5–15% by weight phosphate binder.

4,294,619

METHOD OF PRODUCING PIGMENTED SILICATE COATINGS

Donald C. Dulaney, Gurnee, and John A. Bowman, Wheeling, both of Ill., assignors to Rust-Oleum Corporation, Vernon Hills, Ill.

Filed Apr. 1, 1980, Ser. No. 136,322
Int. Cl.³ C09D *5/04, 5/08, 5/10*
U.S. Cl. 106—188 **4 Claims**

1. A method of manufacturing pigmented hydrolyzed ethyl silicate binders suitable for use in zinc-rich primers wherein an extender pigment suitable for use in zinc-rich primers is added to an organic solvent containing ethyl hydroxy ethyl cellulose, ground in a paint manufacturing grinder to the proper size, and added to a solution containing partially hydrolyzed ethyl silicate.

4,294,620

PHTHALOCYANINE FORMULATIONS

Reinhard Sappok, Heidelberg, and Joachim Kranz, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 29, 1980, Ser. No. 116,582
Int. Cl.³ C09B *47/08*
U.S. Cl. 106—288 Q **10 Claims**

1. A pigmentary phthalocyanine formulation, prepared by a process comprising:

dry milling (a) a crude phthalocyanine with (b) from 2 to 20% by weight, based on (a), of at least one urea derivative of the formula:

$$K\text{—}(\text{—NHCO—NH—R})_2 \quad (I)$$

where K is 1,5-naphthylene or 4,4'-diphenylenemethane; R is alkyl of 12 to 18 carbon atoms, alkenyl of 12 to 18 carbon atoms, 3-(alkoxy of 8 to 18 carbon atoms)-propyl, 2-(alkylthio of 8 to 18 carbon atoms)-ethyl, 2-(alkylamino of 8 to 18 carbon atoms)-ethyl or $-(CH_2)_3-O-(CH_2CH_2O)_n-R^1$, wherein R^1 is alkyl of 2 to 8 carbon atoms or phenyl; and n is a integer of 1 to 4, in the absence of a grinding medium.

4,294,621

PRODUCTION OF AN ANTICORROSIVE PIGMENT ON PHOSPHATE BASIS

Alexander Maurer; Renate Adrian, both of Hürth; Klaus Hestermann, and Gero Heymer, both of Erfstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 16, 1980, Ser. No. 141,135
Claims priority, application Fed. Rep. of Germany, Apr. 20, 1979, 2916029
Int. Cl.³ C08K *3/10;* **C09D** *5/08*
U.S. Cl. 106—306 **8 Claims**

1. A process for making phosphorus-containing anticorrosive pigments with a particle size of at most 20 microns which comprises: converting, with agitation, fine pulverulent calcium and magnesium compounds selected from the group consisting of oxides, hydroxides, carbonates, basic carbonates or carboxylates together with water to a homogeneous suspension; intimately mixing said suspension inside a dispersing means rotating at a speed of 3000 to 10,000 rpm at 0° to 40° C. and in an approximately stoichiometric ratio with phosphoric acid or a solution of acid alkali metal or ammonium phosphates; separating resulting and precipitated pigment and drying it while maintaining its content of water of crystallization, the anticorrosive pigment being comprised of a homogeneous mixture or mixed crystals of which 10 to 95 mol% is calcium hydrogen phosphate dihydrate, the balance being magnesium hydrogen phosphate trihydrate, and of which an at least 55 weight% proportion consists of particles with a size of up to 5 microns with a BET-surface area of at least 1 m^2/g.

4,294,622

DRY WALL JOINT AND FINISHING COMPOUNDS

William F. Brown, Wausau, Wis., assignor to Weston Research Corporation, Wausau, Wis.

Division of Ser. No. 954,445, Oct. 25, 1978, Pat. No. 4,238,239. This application Jun. 9, 1980, Ser. No. 157,306
Int. Cl.³ C04B *11/14*
U.S. Cl. 106—314 **2 Claims**

1. A liquid additive composition for admixing with a wall board joint compound to provide a joint cement, said liquid additive composition comprising an aqueous mixture containing about 0.35 to about 8 weight % zinc oxide, about 0.35 to about 1.5 weight % sodium acetate, about 0.35 to about 3 weight % ammonium alum, and about 0.35 to about 8 weight % of an acrylic resin, based on the total weight of the aqueous mixture.

4,294,623

METHOD OF PRODUCING HIGH PURITY MALTOSE

Hidemasa Hidaka, Urawa; Toshiaki Kohno, Yokohama, and Toshiaki Eida, Chigasaki, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Dec. 5, 1979, Ser. No. 100,435
Claims priority, application Japan, Dec. 7, 1978, 53-150547
Int. Cl.³ C13D *3/12;* **C13K** *7/00;* **C12P** *19/22*
U.S. Cl. 127—55 **3 Claims**

1. Method of producing high purity maltose having more than 97% of maltose content from a saccharified liquor containing less than 0.5% of glucose, 60～85% of maltose and less than 5% of maltotriose, the remainder oligosaccharide and/or dextrin, comprising passing said saccharified liquor through a column filled with granular activated carbon having a peak micropore diameter above 25 Å, thereby removing mainly dextrin, and then passing the liquor through a column filled with granular activated carbon having a main peak of micropore diameter distribution below 25 Å, thereby removing mainly oligosaccharide, and eluting without using any organic solvent.

4,294,624

DRYING CO-MINGLED CARBOHYDRATE SOLUTION AND RECYCLED PRODUCT BY DIELECTRIC HEATING

Preston L. Veltman, 212 Old County Rd., Severna Park, Md. 21146

Filed Mar. 14, 1980, Ser. No. 130,531
Int. Cl.³ C13F *1/00, 5/00;* **C13K** *11/00*
U.S. Cl. 127—62 **13 Claims**

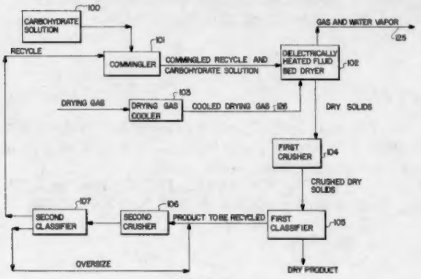
1. A process for drying a carbohydrate solution to form a stable, solid, substantially anhydrous particulate product therefrom comprising:

(a) co-mingling said carbohydrate solution with recycled dry product solid to form a particulate admixture dryable in a dielectrically heated drying zone;

(b) drying said particulate admixture in said dielectrically heated drying zone at a particle temperature below the melting point of said particulate admixture to form said stable, solid, substantially anhydrous product;

(c) removing said stable, solid, substantially anhydrous prod-

uct from the drying zone and dividing it into a first portion and a second portion;



(d) recycling said first portion; and

(e) recovering said second portion.

4,294,625

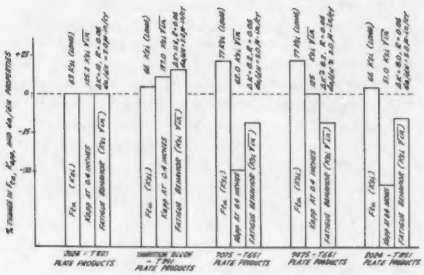
ALUMINUM ALLOY PRODUCTS AND METHODS

Michael V. Hyatt, Bellevue, and William E. Quist, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 974,484, Dec. 29, 1978, abandoned. This application Apr. 18, 1980, Ser. No. 141,272

Int. Cl.³ C22F *1/04*; C22C *21/16*

U.S. Cl. 148—2 **33 Claims**



11. A method for producing a plate product from an aluminum alloy, said product having high strength, high toughness and improved fatigue properties comprising the steps of

providing an alloy consisting essentially of

weight percent	element
3.8 to 4.4	Cu
1.2 to 1.8	Mg
0.3 to 0.9	Mn
0.12 maximum	Si
0.15 maximum	Fe
0.25 maximum	Zn
0.15 maximum	Ti
0.10 maximum	Cr
0.05 maximum	each trace element
0.15 maximum	total of trace elements
balance	Al,

casting said alloy into a body,

hot working said body to form a plate product,

solution heat treating the alloy in said product such that the maximum amount of Cu is taken into solid solution during the solution heat treating step;

quenching said product,

preaging said alloy at room temperature,

thereafter cold rolling said product to reduce the thickness of said product,

and

thereafter stretching said product to relieve residual stresses in said product.

4,294,626

METHOD FOR THE TREATMENT OF SURFACES AND APPARATUS EMPLOYED IN SAID METHOD

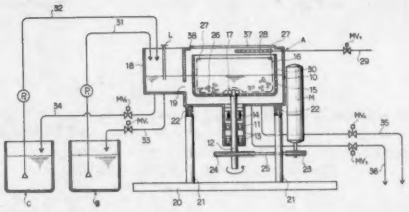
Atsushi Kirisawa, Maehara, Japan, assignor to Japan Envirotic Industry Co., Ltd., Nagoya, Japan

Filed Nov. 2, 1979, Ser. No. 90,578

Claims priority, application Japan, Nov. 9, 1978, 53-138487

Int. Cl.³ C23F *7/26*

U.S. Cl. 148—6.2 **2 Claims**



1. A method of the chromate treatment which comprises; filling materials to be treated into holed container rotatably equipped in a vessel, charging water into said vessel with or without rotation of said holed container, exhausting said water with rotation of said holed container, charging nitric acid solution into said vessel with or without rotation of said holed container, exhausting said nitric acid solution with rotation of said holed container, charging water into said vessel with or without rotation of said holed container, exhausting said water with rotation of said holed container, charging chromate solution into said vessel with or without rotation of said holed container, exhausting said chromate solution with rotation of said holed container, charging water into said vessel with or without rotation of said holed container, exhausting said water with rotation of said holed container, and dehydrating and drying said material treated.

4,294,627

TREATMENT OF TINPLATE SURFACES

Peter J. Heyes, Swindon, England, assignor to Metal Box Limited, Reading, England

Filed May 28, 1980, Ser. No. 153,910

Claims priority, application United Kingdom, Jun. 7, 1979, 19793/79; Apr. 25, 1980, 13748/80

Int. Cl.³ C23F *7/02*

U.S. Cl. 148—6.14 R **8 Claims**

1. A method of treating a tinplate surface comprising the steps: wetting said tinplate surface with a solution free of organic polymeric materials and consisting essentially of a solvent, and a zirconium compound selected from the group consisting of ammonium zirconium carbonate and zirconium acetate at a concentration, calculated as ZrO_2, in the range between 0.1 and 10% w/w; and thereafter heating said tinplate surface to a temperature in the range between 20° and 300° C. until said surface is dry.

4,294,628

METHOD FOR THE PRODUCTION OF CATHODE FOR USE IN ELECTROLYSIS

Kazuki Kasuya, Ichihara, Japan, assignor to Chlorine Engineers Corp., Ltd., Tokyo, Japan

Division of Ser. No. 008,813, Feb. 2, 1979, Pat. No. 4,238,311. This application Jun. 17, 1980, Ser. No. 160,333
Claims priority, application Japan, Feb. 20, 1978, 53/17690
Int. Cl.[3] C25B *11/06, 11/02;* B01J *25/02*
U.S. Cl. 148—6.35 4 Claims

1. A method for producing a cathode for use in electrolysis which comprises:

(a) forming a compact layer of Fe_3O_4 on a substrate of iron or an alloy of iron; and

(b) coating activating nickel comprising mainly nickel or an alloy of nickel on the Fe_3O_4 layer.

4,294,629

DRAWN RODS MADE OF LEAD BRASS AND A PROCESS FOR THE THERMAL TREATMENT THEREOF

Adam Szyszkowski, Tignieu; Marc Moreau, Asnieres, and Pierre Priester, Paris, all of France, assignors to Trefimetaux, Clichy, France

Filed Oct. 2, 1979, Ser. No. 81,173
Int. Cl.[3] C22F *1/08*
U.S. Cl. 148—11.5 C 9 Claims

1. In a process for the thermal treatment of drawn copper-zinc-lead brass alloy stock to improve the machinability by ensuring fine short shavings, the improvement which comprises:

providing a billet consisting essentially on the basis of weight percentage

zinc	30 to 42
lead	1.5 to 4.5
arsenic	≦0.1
aluminum	≦2.5
tin	≦1.3
iron	≦0.1
silicon	≦0.01
copper	balance;

extruding said stock to obtain a blank;

subjecting the blank to a drawing pass to provide stock of a desired final dimension;

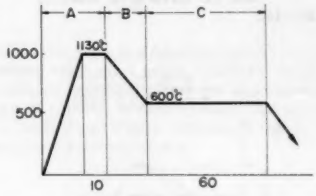
subjecting the drawn stock to a rapid annealing comprising heating said drawn stock to a temperature between about 425° C. and about 10° C. below the solidus temperature of the alloy for a period of between about 1/100 of a second and about 10 minutes.

4,294,630

METHOD AND APPARATUS FOR THE CONTINUOUS FURNACE BRAZING AND SOFT-NITRIDING TREATMENTS OF IRON ARTICLES

Teruoki Watanabe; Tadao Kanno; Akio Hidaka, all of Kawagoe, and Shunji Kobayashi, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1979, Ser. No. 56,922
Claims priority, application Japan, Jul. 12, 1978, 53-84680; Jul. 13, 1978, 53-85384
Int. Cl.[3] C21D *1/48*
U.S. Cl. 148—16.6 12 Claims



1. A method for the continuous furnace brazing and gas soft-nitriding treatments of an iron member, comprising the steps of:

subjecting the iron member to a furnace brazing treatment in a controlled gas for brazing:

furnace-cooling the brazed member only sufficiently to attain a temperature suitable for a subsequent gas soft-nitriding treatment, such that sufficient heat energy is retained from said brazing treatment without re-heating said member for said gas soft-nitriding treatment; and

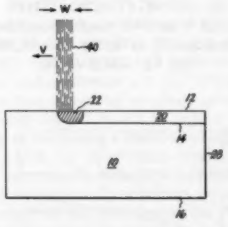
adding a predetermined amount of ammonia gas to said controlled gas to conduct said gas soft-nitriding treatment of said member in the resulting atmosphere.

4,294,631

SURFACE CORROSION INHIBITION OF ZIRCONIUM ALLOYS BY LASER SURFACE β-QUENCHING

Thomas R. Anthony, Schenectady, N.Y., and Harvey E. Cline, Stanford, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,389
Int. Cl.[3] C22F *1/18;* B23K *26/00*
U.S. Cl. 148—133 9 Claims



1. A method for improving the corrosion resistance of a body of a zirconium alloy to high pressure and high temperature steam including the process steps of

(a) heating substantially isothermally, without melting, by means of a scanning laser beam a surface region of said body to a temperature range for a sufficient period of time to assure nucleation and growth of the body centered cubic β grains of said zirconium alloy material; and

(b) quenching said heated surface region at a rate effective to form thereby a metallurgical microstructure in said sur-

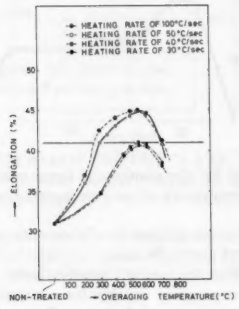
face region consisting of β-quenched zirconium alloy material, said surface region encompassing thereby a core of zirconium alloy material, said core having a metallurgical structure selected to maximize the physical and mechanical properties of the body.

4,294,632

METHOD FOR OVERAGING OF HOT DIP METAL COATED STEEL MATERIAL

Michio Kubota; Kazuhiro Takagi, both of Amagasaki, and Yorimasa Mitani, Osaka, all of Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1979, Ser. No. 78,407
Int. Cl.³ C21D *6/02, 9/48*
U.S. Cl. 148—142 **5 Claims**



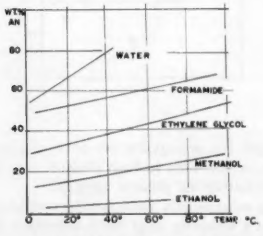
1. A continuous method for the overaging of a hot dip metal coated steel sheet material to improve the formability of the material, which is hard due to the presence of C and N in the form of supersaturated solid solution, said method comprising the steps of continuously passing the material through a heating zone so as to rapidly heat the material at a rate of heating of at least 50° C./sec. to a temperature above 300° C. but below that at which alloying of the coating with the base steel or formation of additional alloys not already present in the coated material will substantially take place, and continuously passing the heated material through a cooling zone so as to cool the material at a controlled rate of cooling of not more than 20° C./sec. until the supersaturation of C and N in the base steel substantially disappears.

4,294,633

BLASTING COMPOSITION

Robert B. Clay, 728 West 3800 South, Bountiful, Utah 84010

Filed Jun. 7, 1979, Ser. No. 46,360
Int. Cl.³ C06B *45/00*
U.S. Cl. 149—2 **14 Claims**



SOLUBILITY OF AMMONIUM NITRATE

1. A blasting agent having a bulk density above 1.0 grams per cc. of generally solid or plastic solid consistency, based largely on particulate ammoniun nitrate, which comprises, in combination:

(a) 60 to 90% by weight, based on the total, of solid particulate oxidizer sale which includes ammonium nitrate, and

(b) 10 to 40% by weight of a thickened liquid component comprising a nitrate oxidizer salt dissolved in a polar organic solvent selected from the group which consists of methanol, ethylene glycol and, said solution being substantially fully saturated by said salt and only partially filling the interstices in component (a) to provide for sensitizing the overall composition to detonation by standard detonating devices.

4,294,634

METHOD FOR MANUFACTURING A SOLID STATUE

Byun Mookil, 190, Simkoc-dong, Buchyun-shi, Kyungki-do, Rep. of Korea

Filed Apr. 1, 1980, Ser. No. 136,267
Int. Cl.³ B32B *31/22;* **B44C** *3/02;* **G09B** *25/00*
U.S. Cl. 156—59 **7 Claims**

1. A method of producing a three-dimensional solid art object comprising:

forming a solid basic body and component parts from a shapeable art medium in initial shapes corresponding approximately to those of said solid basic body and said component parts when said three-dimensional solid art object is assembled and finished,

adhesively attaching said component parts on said solid basic body to form an assembled object with a three-dimensional surface;

adhesively and conformationally attaching a covering sheet to the three-dimensional surface of said assembled object to form said three-dimensional solid art object.

4,294,635

PROCESS FOR MAKING GLAZED CERAMIC WARE

Donald C. Hurley, Jr., 183 St. Joseph Ave., Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 718,344, Aug. 27, 1976, Pat. No. 4,200,468. This application Jan. 28, 1980, Ser. No. 116,229
Int. Cl.³ C03C *5/02*
U.S. Cl. 156—89 **8 Claims**

1. A process for making a glazed ceramic ware comprising the steps of:

(a) mixing sufficient clay, feldspar, flux and water containing a deflocculant to form a slurry glaze-forming composition, said slurry composition consisting essentially of at least 30%, by weight, of clay, and where the molecular ratio of flux to alumina to silica in said slurry is from 1–0.1–1.15 to 1–1.05–9.2 and wherein said deflocculant is included with said water to minimize the amount of said water necessary to form said slurry;

(b) applying the slurry onto the surface of an unfired clay body to form a decorative pattern;

(c) firing the combined clay body and decorative pattern so that they are matured in one firing operation.

4,294,636

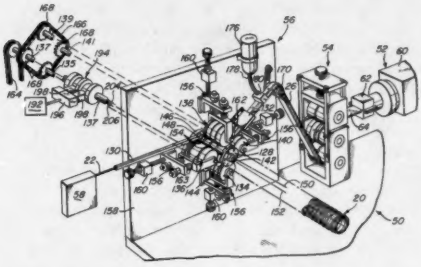
METHOD AND APPARATUS FOR MAKING WIRE REINFORCED HOSE

Frank A. Vitellaro, Trenton, N.J., assignor to Dayco Corporation, Dayton, Ohio

Filed Jul. 10, 1980, Ser. No. 167,293

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—143 **12 Claims**



1. A method for producing a reinforced flexible polymeric hose which comprises the steps of extruding a continuous flat strip of polymeric material, forming said flat strip to define a profiled strip having a flat side portion and a convoluted portion by continuously passing said flat strip between two profiled rollers to thereby define the desired strip profile with the convoluted side portion, and thereafter helically winding said profiled strip with adjoining turns in overlapping relation, disposing a reinforcing wire in said convoluted side portion in sandwiched relation between the overlapping portions during said helical winding step, and bonding together the overlapping portions.

8. A flexible hose forming apparatus comprising:

(a) extruder means for forming an elongated flat strip of polymeric material;

(b) means for shaping said flat strip to define a profiled strip having a flat side portion and a convoluted side portion, said strip shaping means comprising at least two spaced profiled rollers having parallel axes of rotation, a first of said rollers having a circumferential ridge and a second of said rollers having a corresponding circumferential groove, said ridge and said groove cooperating to form a convolution in said polymeric strip passing therebetween;

(c) means for helically winding said profiled strip with adjoining turns having portions in overlapping relation;

(d) means for disposing a reinforcing wire in said convoluted side portion in sanwiched relation between said overlapped strip portions; and

(e) means for bonding said overlapping portions.

4,294,637

PROCESS FOR MANUFACTURE OF A WIDE PATTERNED BAND SUCH AS A TRANSFER-CARRYING SHEET AND FOR PRINTING ON A SUBSTRATE THEREWITH

Björn S. Rump, Le Rossignol, Vandoeuvres, Switzerland (1253), assignor to Björn Sigurd Rump, Switzerland

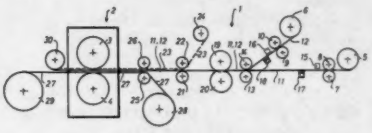
Division of Ser. No. 598,545, Jul. 23, 1975, abandoned, which is a continuation of Ser. No. 893,289, Apr. 5, 1978, abandoned, which is a continuation of Ser. No. 961,231, Nov. 16, 1978. This application Dec. 21, 1977, Ser. No. 862,834

Claims priority, application Switzerland, Jul. 31, 1974, 10568/74; Jul. 31, 1974, 10570/74

Int. Cl.³ B44C *1/16*; B41M *5/26*; B31F *5/00*; B65H *69/02*

U.S. Cl. 156—157 **16 Claims**

1. A process for the transfer printing of a substrate from opaque transfer webs of lesser width than said substrate, said transfer webs each having a straight edge and carrying transferable designs or patterns, said process comprising the steps of: aligning at least two transfer webs with their respective straight edges near and parallel to each other; feeding the thus aligned transfer webs, together with the substrate onto which the designs or patterns are to be transferred, into transfer means; and transferring the designs or patterns onto the substrate in the transfer means after previously adjusting the relative position of the webs in a direction parallel to said straight edges, utilizing registration means which are formed on said transfer webs but are separate from and non-transferable with said designs or patterns, in such a manner that the designs or patterns on each of said transfer webs are in register with each other during said transferring step.



4,294,638

CIRCULAR EXTRUSION METHOD PROVIDING FOR ROTATION AROUND THE EXTRUSION OPENING

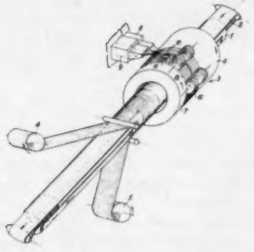
Ole-Bendt Rasmussen, 7, Topstykket, 3460 Birkeroed, Denmark

Continuation of Ser. No. 841,481, Oct. 12, 1977, abandoned, which is a continuation of Ser. No. 657,649, Feb. 12, 1976, abandoned. This application Dec. 11, 1979, Ser. No. 102,561

Claims priority, application United Kingdom, Feb. 12, 1975, 5971/75

Int. Cl.³ B29F *3/10*

U.S. Cl. 156—176 **35 Claims**



1. An improved method of extruding elongated structures in annular form, by feeding an inhomogeneous extrudable material in a generally fluid state through a circular die which has a hollow center and an annular die part defining at least one extrusion exit orifice extending annularly around the die part and rotating bodily around its axis to extrude with substantial helical drawing or stretching a material structure in generally annular form which has a generally uniaxial grain therein extending in a substantially helical direction making a significant angle with respect to the extrusion die axis, the method being characterized by the following steps:

supplying said extrudable material to said circular die while rotating said annular die part;

discharging the extrudable material from the rotating exit orifice defined by said die part in at least one stream extending in generally annular form;

collecting the thus discharged generally annular-form stream of extrudable material in a collecting zone downstream of such exit orifice by collecting means comprising a generally rigid support and a conveying surface which receives said stream and at least said conveying surface extending axially through said hollow interior and being moved forwardly along the extrusion die axis to convey

the extrudable material stream collected thereon from said die orifice while said annular die part is rotating bodily around its axis about said conveying surface, whereby the material stream is drawn or stretched at an angle to the extrusion axis by virtue of said rotation between said exit orifice and said conveying surface;

solidifying the collected material stream while being conveyed; and

removing said solidified material stream from at least the support of said collecting means.

4,294,639

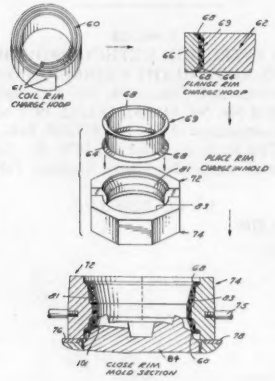
FIBER-REINFORCED COMPOSITE WHEEL CONSTRUCTION

James A. Woelfel, and Richard W. Smith, both of Lansing, Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 14,265, Feb. 22, 1979, abandoned. This application Feb. 6, 1980, Ser. No. 119,128

Int. Cl.[3] **B65H** *81/00*

U.S. Cl. 156—185 **44 Claims**



1. A method of constructing a vehicle wheel of the type which includes a rim portion for mounting of a tire thereon and a disc portion for mounting the wheel to a vehicle, said method comprising the steps of:

(a) coiling a first sheet section of fiber-reinforced plastic resin construction having laterally spaced parallel side edges to form a rim charge hoop consisting of at least one coil ply having said laterally spaced side edges disposed in respective axially spaced planes,

(b) placing said rim charge hoop in a mold,

(c) placing a separate disc charge into said mold within said rim charge hoop, said disc charge comprising at least one second sheet section of fiber-reinforced plastic resin construction,

(d) compression molding said rim and disc charge to form an integral fiber-reinforced composite wheel, and

(e) removing said wheel from said mold.

4,294,640

FORMING PROCESS FOR LIGHT GAUGE POLYMER SHEET MATERIAL

Lawrence G. Martinelli, San Jose, and Mark R. Garrison, Santa Clara, both of Calif., assignors to Verbatim Corporation, Sunnyvale, Calif.

Filed Dec. 12, 1979, Ser. No. 102,777

Int. Cl.[3] **B29C** *17/04;* **B29F** *1/10;* **B29C** *3/00;* **B65D** *85/30*

U.S. Cl. 156—213 **5 Claims**

1. A method for forming a substantially flat, warp-free flexible magnetic disk jacket assembly from a pre-cut sheet of light gauge polymeric material having wipe material pre-attached to one planar side thereof, comprising the steps of:

clamping a rear panel region of a pre-cut sheet of light gauge polymeric material having wipe material pre-attached to one planar side thereof between a first substantially rigid base and a second substantially rigid square-shaped folding member so that said wipe material is contacted by said substantially rigid folding member, said pre-cut sheet being essentially at room temperature;

folding a front panel region of said sheet over said substantially rigid folding member by means of a first substantially rigid folding bar into a substantially 180° flat fold whereby a first folded edge is formed in said sheet;

retaining said front panel region of said sheet in said folded condition without slippage by means of said first substantially rigid folding bar;

folding a first and a second tab region of said sheet over said front panel region by means of a second and a third substantially rigid folding bar into substantially 180° flat folds whereby a second and a third folded edge are formed in said sheet, said second and third folded edges being formed essentially perpendicularly to and extending from opposite terminal ends of said first folded edge along opposite edges of said rear panel region whereby a pocket is formed between said front panel region and said rear panel region, said pocket being enclosed around its edges by said first, second and third folded edges, said pocket having an open end along an edge of said front panel

region opposite to said first folded edge, said open end extending between said terminal ends of said second and said third folded edge furthest from said first folded edge;

retaining said first and second tab regions of said sheet in said folded condition without slippage by means of said second and third substantially rigid folding bar;

applying heat uniformly along said first, second and third folded edges of said sheet by contacting said outer surface of said sheet with a first, a second and a third heated bar having a U-shaped trough adapted to mate with said outer surface of said sheet along said folded edges;

inserting a flexible magnetic disk into said pocket;

folding a third tab region of said sheet over said front panel region by means of a fourth substantially rigid folding bar into a substantially 180° flat fold whereby a fourth folded edge is formed in said sheet, said fourth folded edge being formed essentially perpendicular to said second and third folded edge, extending between said terminal ends of said second and third folded edge furthest from said first folded edge;

retaining said third tab region of said sheet in said folded condition without slippage by means of said fourth substantially rigid folding bar; and

applying heat uniformly along said fourth folded edge of said sheet by contacting said outer surface of said sheet with a fourth heated bar having a U-shaped trough adapted to mate with said outer surface of said sheet along said folded edge.

4,294,641

HEAT TRANSFER SHEETS

Kenneth J. Reed, Deer Park Rd., Wimbledon, London, S.W. 19, and Alan L. Lythgoe, 25 Sene Park, Hythe, Kent, both of England

Continuation of Ser. No. 817,707, Jul. 21, 1977, abandoned. This application Jul. 6, 1979, Ser. No. 55,929

Claims priority, application United Kingdom, Jul. 23, 1976, 30925/76

Int. Cl.[3] **B32B** *3/18;* **B41M** *5/26;* **B44C** *1/16*

U.S. Cl. 156—234 **34 Claims**

1. A method of marking or decorating a textile or other absorbent surface with a design, said method comprising the steps of:

(a) providing a heat transfer including a flexible support substrate coated with a solid printing ink layer embodying the design to be transferred,

(b) contacting the printing ink layer face to face with the textile under conditions of temperature and pressure which do not damage the textile and which cause the solid printing ink layer to melt to a liquid ink composition having a viscosity less than 100 poise and to penetrate the textile and transfer the ink layer to the textile as a nonlabel like design,

(c) separating the support substrate from the textile with the transferred design being retained in the form of solid ink within the textile,

(d) said solid printing ink layer being substantially non-tacky and non-blocking at room temperature and including at least one polymer having solid particles of a tack reducing agent present as a separate phase in at least a surface portion of the layer,

(e) said tack reducing agent being sublimable at said elevated temperature or having a melting point of at least 60° C. and melting at said elevated temperature to a liquid which reduces the viscosity of the polymer composition.

4,294,642

PROCESS FOR THE PRODUCTION OF PACKAGE FOR CIGARETTES OR THE LIKE

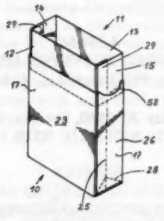
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Division of Ser. No. 886,700, Mar. 15, 1978, Pat. No. 4,225,040. This application Dec. 5, 1979, Ser. No. 100,784

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712482

Int. Cl.[3] **B65D** *85/10*

U.S. Cl. 156—250 **3 Claims**



1. A method for the production of cigarette pack blanks from a web of relatively thick, stiff cardboard, paste board or the like, said blanks being subsequently folded in a U-shape around the front, bottom and rear surfaces of a rectangular block of cigarettes, and wherein the lateral edges of said web coincide with the upper edges of the blanks laid out thereon, after folding, characterized by the steps of:

(a) coating one entire surface of said web (**34**) with a moisture and aroma-proof metal coating (**17**), said one surface being the outer surface of the folded cigarette pack,

(b) applying by gluing or the like a pair of relatively thin and pliable, continuous strips of metal foil (**11***a*, **11***b*) to the respective lateral edges of said web on the other side thereof opposite said metal coating such that the outer edges of said metal foil strips extend outwardly beyond the lateral edges of said web,

(c) applying a relatively thin and pliable sealing layer (**30**, **33**) of metal foil to said other side of said web at least in the areas which form the four bottom corners of the folded pack, and

(d) separating said blanks from said web by cross stamping.

4,294,643

HEATER ASSEMBLY AND METHOD OF FORMING SAME

Thomas D. Tadewald, La Crosse, Wis., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 5, 1978, Ser. No. 939,764

Int. Cl.[3] **B29C** *19/00;* **B32B** *31/00*

U.S. Cl. 156—293 **7 Claims**

1. A method of forming a heater plate assembly comprising the steps of: forming a C-stage laminate assembly from layers of glass cloth and epoxy resin with at least one cut-out opening therein for receiving at least one complementary shaped heater member; laying up a stack of B-stage layers of epoxy resin coated glass; positioning at least one heater member within said at least one cut-out opening in said C-stage assembly so that its flat outer surface is exposed and its inner surface is in surface contact with said stack of B-stage layers; applying heat and pressure to the top and bottom of said final laminate assembly to cure said B-stage layers and bond them to each other and to said C-stage laminate and to the inner surface of said at least one heater member; said at least one heater member being of a more thermally conductive material than the adjacent portions of C-stage laminate so that when said heat is applied, the resin in the B-stage layers in the regions immediately laterally adjacent the said at least one heater member will become liquid sooner than in areas further laterally spaced from said at least one heater member and will tend to flow toward said heater member and seal the open area between the edges of the heater member and the internal edges of the C-stage laminate which define said at least one opening.

4,294,644

SERVO MOTOR CONTROL LABELLER

Dale L. Anderson, Mound, Minn., assignor to Datafile Limited, Toronto, Ontario, Canada

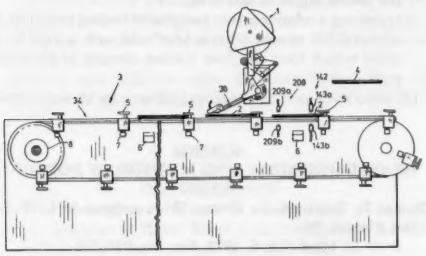
Filed Jan. 30, 1980, Ser. No. 112,341

Int. Cl.[3] **B32B** *31/00*

U.S. Cl. 156—361 **48 Claims**

1. In a labeller actuated to advance and dispense labels by a rotary drive onto a surface fed therepast, a servo motor for actuating said labeller drive and a control system for said servo motor, said system having means adapted to respond to the rate of feed of a surface to be labelled to accelerate the servo motor from zero to the desired labelling speed corresponding to the rate of feed of the surface to be labelled while the surface to be labelled is advanced towards the labeller a predetermined distance, and means to decelerate the servo motor from labelling speed to zero while label feed is advanced a predetermined distance, the system being adapted so that upon a label instructing signal being fed to the control system at a preselected point of advance of the surface towards the labeller, the labeller will accelerate a label from a predetermined start position and

deliver same to touch down on the surface to be labelled at the precise desired point with the label moving at the same speed as the surface and upon a label feed sensing signal generated by



label feed being fed to the control system the labeller will decelerate to bring the next label to be delivered to said predetermined start position in preparation for the next label instructing signal.

4,294,645

LABEL APPLICATORS

Anthony V. J. Figg, Spalding, and Harry Cunnington, Boston, both of England, assignors to Norprint Limited, Boston, England

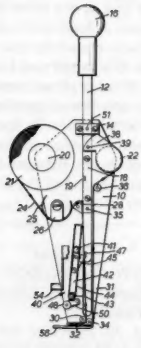
PCT No. PCT/GB79/00005, § 371 Date Sep. 12, 1979, § 102(e) Date Sep. 12, 1979, PCT Pub. No. WO79/00499, PCT Pub. Date Aug. 9, 1979

PCT Filed Jan. 11, 1979, Ser. No. 74,724

Claims priority, application United Kingdom, Jan. 12, 1978, 1160/78; Jul. 20, 1978, 30511/78

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—384 **19 Claims**



1. Apparatus for dispensing individual labels from a web of labels including a backing strip and a series of labels mounted on the backing strip, said apparatus comprising in succession along a web path through the apparatus,

reel mounting means for carrying a reel of the said web,

continuously-operative brake means for applying a continuous braking force to the web,

a rotary registration device co-operating with the web,

dispensing means at which individual labels can be peeled from the backing strip of the web,

a take-up reel for taking up spent backing strip, and

means for synchronously actuating the registration device and the take-up reel to index the web through the apparatus and dispense a label at the dispensing means.

4,294,646

APPARATUS FOR MANUFACTURING FLAT PLASTIC NET

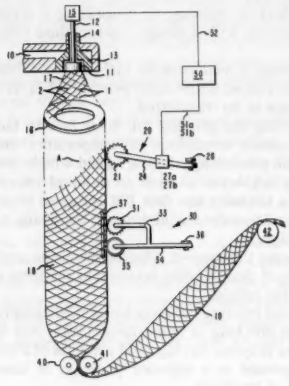
Thomas Urquhart, Cobourg, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 26,206, Apr. 2, 1979, Pat. No. 4,242,295. This application Jun. 3, 1980, Ser. No. 155,980

Claims priority, application Canada, Oct. 4, 1978, 312717

Int. Cl.³ B29C *17/14*

U.S. Cl. 156—500 **5 Claims**



1. An apparatus comprising in combination

(a) an extruder adapted to extrude, about an axis of extrusion, plastic net in tubular form through two coaxial circular counter-rotating die members, said plastic net comprising a plurality of crossing plastic strands;

(b) a detector adapted to detect the angular displacement of substantially successive longitudinally-aligned junctions of the crossing strands about the axis of extrusion and relative to a fixed plane through the axis of extrusion;

(c) a controller adapted to regulate the relative rotation of the die members to minimize said angular displacement;

(d) guide means, adapted to align successive longitudinally aligned junctions of the strands of the tubular net with a cutting means, said cutting means being adapted to cut each junction longitudinally and within each junction; and

(e) advancing means adapted to move the tubular net from the extruder past said cutting means, and to tension the tubular net during extrusion of the plastic net.

4,294,647

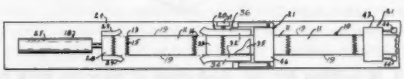
WOOD FINGER JOINTING APPARATUS

Melvin D. Strickler, 192 Larch La., Columbia Falls, Mont. 59912

Filed May 20, 1980, Ser. No. 151,714

Int. Cl.³ B27F *1/16*; B32B *31/20*

U.S. Cl. 156—558 **7 Claims**



1. Apparatus for end joining straight elongated boards having a preselected maximum length and a common transverse cross section, the boards having complementary configurations of elongated parallel fingers formed between opposed side edges of the boards across opposed first and second transverse end faces thereof, comprising:

an elongated frame;

guide means on the frame for engaging the opposed side

edges of the boards and directing the boards along a straight path parallel to the board lengths;

ram means movably mounted on said frame at a location adjacent the guide means at one end of the path for reciprocating movement along the path in a first direction for engaging successive boards across their first end faces and for imparting movement to the boards along the path their second end faces into mating engagement with the first end faces of preceeding boards and in an opposite second direction for providing clearance for engagement of incoming boards by said guide means;

said ram means having a ram face for engaging the first end faces of the boards, said ram face having a configuration matching the finger configuration of the first board ends;

channel means on said frame positioned transversely adjacent to the path for receiving successive boards moved along the path by the ram means and for transversely engaging the opposed edges of the board to align the first end of each board with the second end of a preceding board at the instant of mating the joint between them; and

thrusting means on the frame for clamping opposed side edges of the boards and forcibly resisting movement of the mated first and second ends of successive boards as imparted by said ram means.

4,294,648

METHOD FOR INCREASING THE RESISTANCE OF IGNITER ELEMENTS OF GIVEN GEOMETRY

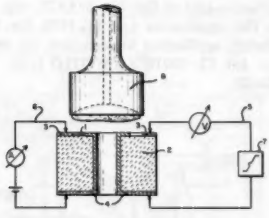
Uwe Brede, Fürth, and Heinz Kern, Fürth-Burgfarnbach, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Postfach, Fed. Rep. of Germany

Filed Feb. 26, 1980, Ser. No. 124,894

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1979, 2908361

Int. Cl.³ C23F *1/02*

U.S. Cl. 156—627 **7 Claims**



1. A method for increasing the resistance of an igniter element of given geometry in an electrical circuit to a predetermined, specific value by the removal of resistance material, which comprises heating the resistance material situated between two acid-resistance electrodes simultaneously etching the resistance material with acid until the desired resistance value has been established.

4,294,649

METHOD OF MAKING DIE PLATES

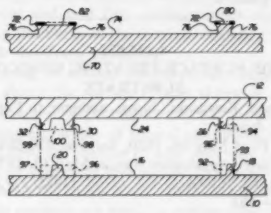
Albert J. Sarka, 18828 Canyon Dr., Fairview Park, Ohio 44126

Filed Nov. 5, 1979, Ser. No. 91,361

Int. Cl.³ C23F *1/02*

U.S. Cl. 156—645 **7 Claims**

1. A method of forming accurately located lands on an opposing pair of die plates, the lands cooperating to cut material pressed between the die plates in regions where the lands on one die plate are positioned in a predetermined relationship with the lands on the opposite die plate, said method comprising the steps of forming a master image having lines representing the lands to be formed on both die plates, the lines in said master image having a width exceeding by a predetermined amount a desired width of the cooperating lands on the die plates, utilizing the master image to directly control exposure of a resist on the surface of the two die plates, chemical etching of the surface of the two die plates until raised portions configured the same as the lines of said master image are formed on each die plate, and thereafter selectively removing material from at least one side of the raised portions on each plate until the lands of each plate are formed.



4,294,650

METHOD OF AND APPARATUS FOR PRODUCING EMBOSSING TOOLS

Wilfried Werthmann, Krefeld, Fed. Rep. of Germany, assignor to Firma Standex International GmbH, Krefeld, Fed. Rep. of Germany

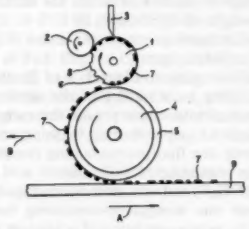
Continuation of Ser. No. 878,432, Feb. 16, 1978, Pat. No. 4,213,819. This application Jan. 7, 1980, Ser. No. 110,252

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706947

The portion of the term of this patent subsequent to Jul. 22, 1997, has been disclaimed.

Int. Cl.³ C23F *1/02*

U.S. Cl. 156—660 **9 Claims**



1. A method of making a large-format surface-texture embossing tool free from pattern-separating lines for the embossing plates, sheets, or foils, said method comprising the steps of:

(a) juxtaposing a large-format press plate having a width in excess of 160 centimeters with a synthetic elastic-surfaced transfer roll of a length substantially corresponding to said width;

(b) applying a layer of an etching resist to a patterned roll having a surface texture corresponding to the pattern to be applied to said plate to impart a corresponding pattern to said layer;

(c) rotating said rolls into close proximity to each other to deposit said layer onto said transfer roll substantially over a length thereof corresponding to said width;

(d) rolling said transfer roll over a surface of said press plate and relatively displacing said transfer roll and said press plate to deposit the layer of said resist from the synthetic elastic surface of said transfer roll onto said surface of said plate while leaving exposed locations of said surface of said plate within the pattern of the resist layer deposited thereon;

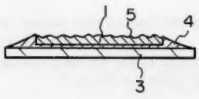
(e) etching said locations of said surface of said plate; and
(f) repeating steps (a) through (e) in succession with application of a second layer of resist to said surface of said plate in a pattern out of perfect registry with the previously applied pattern.

4,294,651

METHOD OF SURFACE-TREATING SEMICONDUCTOR SUBSTRATE

Sohshi Ohmura, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed May 16, 1980, Ser. No. 150,686
Claims priority, application Japan, May 18, 1979, 54-61228
Int. Cl.[3] C09K *13/02, 13/08;* **H01L** *21/306*
U.S. Cl. 156—662 **10 Claims**



1. A method of roughening at least one surface of a silicon semiconductor substrate comprising the step of bringing each surface of the semiconductor substrate that is to be roughened into contact with an etchant comprising (i) at least one fluorine-containing compound selected from the group consisting of hydrofluoric acid (HF), ammonium fluoride (NH_4F) and acid ammonium fluoride (NH_4HF_2), (ii) at least one oxidizing agent selectively containing manganese and chromium, and (iii) an alkali.

2. The method of claim **1**, wherein the etchant contains, based on the weight of the etchant, (i) 7% to 38% by weight of the fluorine-containing compound, (ii) 2.5% to 7% by weight of the manganese- or chromium-containing oxidizing agent and (iii) 1% to 10% by weight of the alkali.

3. The method of claim **1**, wherein the etchant comprises, based on the weight of the etchant, (i) 13% to 35% by weight of the fluorine-containing compound and (ii) 3% to 7% by weight of the oxidizing agent.

7. A method according to claim **1**, **2** or **3**, wherein prior to the step of bringing each surface of the semiconductor substrate to be etched into contact with the etchant, each said surface is subjected to a pre-etching by using an etchant comprising (i) at least one fluorine-containing compound selected from the group consisting of hydrofluoric acid (HF), ammonium fluoride (NH_4F) and acid ammonium fluoride (NH_4HF_2) and (ii) at least one manganese-containing oxidizing agent selected from the group consisting of potassium permanganate ($KMnO_4$) and potassium manganate (K_2MnO_4).

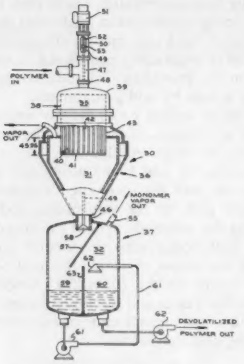
4,294,652

FALLING STRAND DEVOLATILIZER

Randolph E. Newman, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 30, 1980, Ser. No. 164,414
Int. Cl.[3] B01D *1/00*
U.S. Cl. 159—2 R **5 Claims**

1. An improved staged falling strand devolatizing apparatus for a polymer-monomer melt, comprising a heating means for said melt mounted integrally above first and second flash vaporization tanks positioned respectively in contiguous descending vertical relationship and communicating with one another, means for producing a different vacuum within each of said flash vaporization tanks and means for maintaining an elevated temperature in said tanks, the improvement comprising: said second tank having a baffle means to pass the falling strand melt to a first bottom side compartment of said second tank, a recycle transfer means for the melt from said first side compartment to a second bottom side compartment in said second tank such that the melt is devolatilized again by the vacuum applied to said second tank and a means to withdraw the melt from said second side compartment, said first and second bottom side compartments are formed by a generally vertical partition dividing said second tank into substantially



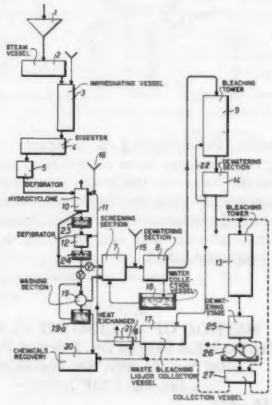
equal compartments, said partition extending from the bottom of said second ta..k for a portion of the vertical dimension of said second tank allowing each compartment to operate under a common partial vacuum contained in said second tank.

4,294,653

PROCESS FOR MANUFACTURING CHEMIMECHANICAL CELLULOSE PULP IN A HIGH YIELD WITHIN THE RANGE FROM 65 TO 95%

Jonas A. I. Lindahl, Domsjoverken, and Lars G. Rudstrom, Husum, both of Sweden, assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Continuation-in-part of Ser. No. 615,625, Sep. 22, 1975, abandoned. This application Apr. 11, 1978, Ser. No. 895,163
Claims priority, application Sweden, Sep. 23, 1974, 7411949
Int. Cl.[2] D21B *1/16;* **D21D** *1/20*
U.S. Cl. 162—25 **33 Claims**



1. In the process for the manufacture of chemimechanical cellulose pulp in high yields within the range from about 65 to about 95% from particulate lignocellulosic material which comprises subjecting particulate lignocellulosic material to a mild partial digestion in the presence of a delignifying agent, and then mechanically defibrating the partially digested material, the improvement which comprises blending the partially digested lignocellulosic material after it has been defibrated to

within the range from about 27 to about 44% of completion with waste bleaching liquor from a lignin-preserving bleaching process cooled to a temperature not exceeding 40° C.; and then completing the defibration to obtain a pulp of improved brightness and strength.

4,294,654

DELIGNIFICATION AND BLEACHING OF LIGNOCELLULOSIC PULP VIA PHOTO-OXYGENATION

Rex H. Turner, Mobile, Ala., assignor to International Paper Company, New York, N.Y.

Filed Mar. 21, 1980, Ser. No. 132,604
Int. Cl.³ D21C *5/00, 9/10*
U.S. Cl. 162—50 **12 Claims**

1. A process for delignification and bleaching of lignocellulosic pulp employing electronically excited oxygen generated in situ, which comprises:

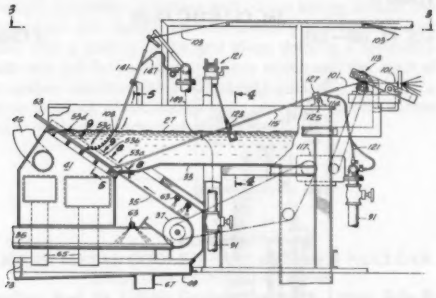
subjecting an aqueous slurry of said lignocellulosic pulp having a consistency of from about 0.01% to about 10.0%, by weight of oven-dried pulp, and whose slurry pH is between about 8 and about 13 to irradiation with ultraviolet light while admitting oxygen into said slurry, whereby the ultraviolet light excites the oxygen to produce electronically excited oxygen in situ which bleaches and delignifys the pulp.

4,294,655

METHOD AND APPARATUS FOR FORMING FIBERGLASS MATS

John R. Pfeffer, Bakersfield, Calif., assignor to Consolidated Fiberglass Products Company, Bakersfield, Calif.

Continuation of Ser. No. 886,881, Mar. 15, 1978, abandoned. This application Nov. 27, 1979, Ser. No. 97,776
Int. Cl.³ D21H *3/82*
U.S. Cl. 162—107 **14 Claims**



1. The method of making a wet process fiber mat comprising the steps of:

a. forming an aqueous body of chopped fiber slurry;

b. moving an endless screen upwardly through said slurry from an entrance position spaced substantially below said slurry surface and at a predetermined rate of movement to an exit position at the surface of said slurry;

c. applying suction to the lower surface of said screen, in a zone through which said screen moves in order to draw water of said slurry through said screen thereby;

d. collecting a first layer of chopped fibers on the surface of the screen with increasing thickness as the distance traveled by the screen through the slurry increases;

e. positioning a first reinforcement strand projecting means beneath the surface of the slurry;

f. projecting a plurality of first continuous reinforcement strands through said first strand projecting means below the slurry surface by propelling said first strands at approximately the same velocity as said screen onto said first chopped fiber layer at a first predetermined location intermediate the ends of the screen thereby depositing said first reinforcement strands in a longitudinally oriented configuration and in a first substantially horizontal plane within the resultant mat;

g. collecting a second layer of chopped fibers on top of said first layer and said first reinforcement strands with increasing thickness as the distance traveled by the screen through the slurry increases;

h. positioning a second reinforcement strand projecting means above the surface of said slurry at a location between the first projecting means and the exit position;

i. projecting a plurality of second continuous reinforcement strands onto the surface of said slurry by projecting said second strands from said second strand projecting means from above the slurry surface onto that slurry surface near said exit position at a velocity greater than the velocity of said screen such that the second strands assume a randomly oriented interengaged configuration upon entering said slurry;

j. allowing said random interengaged strands to migrate in an unconstrained manner from the slurry surface through the slurry and onto said second chopped fiber layer captured by the screen at a second predetermined location intermediate the ends of said screen thereby depositing said second reinforcement strands in a substantially horizontal plane within the resultant mat so that both random and longitudinal reinforcement strands will be present in the resultant mat;

k. continuing the movement of the screen past the point of randomly oriented strand installation to cover said strands with a third uniform layer of chopped fibers; and

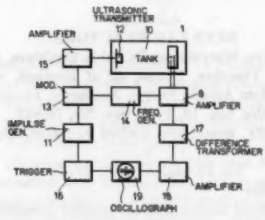
l. moving the screen out of the slurry, thus withdrawing the wet mat from the slurry.

4,294,656

PROCESS FOR MEASURING THE STATE OF CHARGE OF SUSPENSIONS AND FOR CONTROLLING THE ADDITION OF AUXILIARY AGENTS TO THE SUSPENSIONS

Ulrich Beck, Bornheim-Merten, and Ekhard Rohloff, Düsseldorf, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 949,357, Oct. 6, 1978, abandoned. This application Apr. 1, 1980, Ser. No. 136,188
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746179
Int. Cl.³ D21F *11/00*
U.S. Cl. 162—192 **6 Claims**



1. A process for controlling the addition of retention agents to a fibrous suspensions, comprising the steps of: exposing a portion of the suspension of an ultrasonic field in a measuring cell having two electrodes which extend into the suspension and are spaced from each other by an odd multiple of half ultrasonic wavelengths of the ultrasonic field in the suspension; measuring the ultrasonic vibration potential generated by the ultrasonic field; and adding retention agents to the suspension in response to the magnitude of the measured ultrasonic vibration potential.

4,294,657

APPARATUS FOR MAKING FIBERBOARD

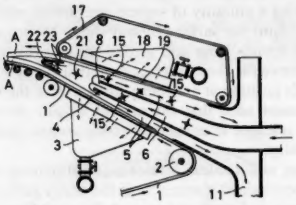
Tsutomu Saito, Tokyo, and Masaaki Shida, Fuji, both of Japan, assignors to Kabushiki Kaisha Fuji Seisakusho, Fuji, Japan

Continuation of Ser. No. 7,641, Jan. 29, 1979, abandoned. This application Aug. 5, 1980, Ser. No. 175,826

Claims priority, application Japan, Nov. 15, 1976, 51-136268; Jan. 31, 1978, 53-8850

Int. Cl.[3] D21F *11/02*

U.S. Cl. 162—303 2 Claims



1. An apparatus for manufacturing fiberboard, comprising:
a first endless belt conveyor having a slanted portion constituting a first fiber layer forming section;
a first suction box provided on the inner surface of said first fiber layer forming section;
a second endless belt conveyor having a slanted portion constituting a second fiber layer forming section disposed above said first fiber layer forming section;
a second suction box provided on the inner surface of said second fiber layer forming section;
a passage means disposed between said first and second fiber layer forming sections for directing a slurry flow of fibers and so arranged whereby the speed of the slurry flow through the passage and onto the surfaces of said first and second fiber layer forming sections is differentiated from the running speed of said conveyors;
a supply duct for the slurry of fibers, said duct being disposed in the center of said passage and having an outlet positioned near the upper ends of said first and second fiber layer forming sections whereby the slurry flow of fibers from said outlet diverges upwards and downwards and flows down the respective first and second fiber layer forming sections so that two separate fiber layers may be formed simultaneously and subsequently placed one upon another to form a single sheet of fiberboard.

4,294,658

NUCLEAR REACTORS

Peter Humphreys, Warrington; Daniel F. Davidson, Altrincham, and Gordon Thatcher, Lymm, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

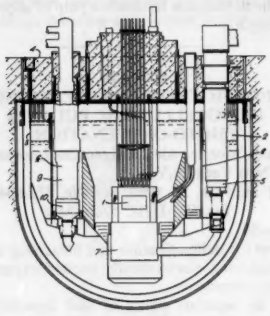
Filed Sep. 19, 1979, Ser. No. 76,943

Claims priority, application United Kingdom, Oct. 9, 1978, 39814/78

Int. Cl.[3] G21C *9/00, 15/18*

U.S. Cl. 376—404 3 Claims

1. A liquid metal cooled nuclear reactor comprising:
a primary vessel;
a fuel assembly submerged in a pool of primary liquid metal coolant within the primary vessel;
a concrete vault housing said primary vessel;
at least one heat exchange module carried by a roof of the vault and immersed in the pool of coolant, and
a pump for circulating primary coolant from the pool through the fuel assembly to the heat exchange module, the heat exchange module comprising a tube-in-shell heat exchanger and an electromagnetic flow coupler disposed in the base region of the module for driving primary coolant through the heat exchanger, the electromagnetic flow coupler being associated with a secondary coolant



circuit from which the driving effort for the primary coolant is derived.

4,294,659

APPARATUS FOR USE IN A LIQUID ALKALI METAL ENVIRONMENT

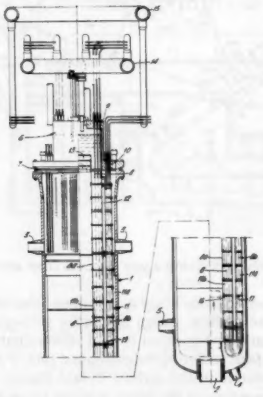
Charles S. Campbell, Hale, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 16, 1978, Ser. No. 869,443

Claims priority, application United Kingdom, Feb. 4, 1977, 11924/77

Int. Cl.[3] G21C *19/28*

U.S. Cl. 165—133 3 Claims



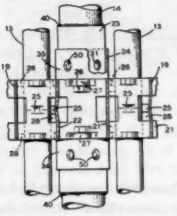
1. Heat exchange apparatus for use in a liquid alkali metal environment comprising,
a bundle of spaced heat exchange tubes of stainless steal,
a tubular shell housing the tubes and adapted by inlet and outlet ports for conducting liquid alkali metal therethrough in heat exchange with the tubes, and
a plurality of cellular grids laterally supporting the tubes in the shell, each tube slidably occupying a discrete cell of each grid and wherein the complementary bearing surfaces of the grids for the tubes are aluminised.

4,294,660

SPACER ASSEMBLY RETAINER ARRANGEMENT

David W. Christiansen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Oct. 7, 1977, Ser. No. 840,207
Int. Cl.³ G21C *3/30*
U.S. Cl. 376—442 **4 Claims**



1. In combination with a nuclear fuel assembly of the type having a plurality of vertically extending fuel elements and guide tubes maintained in a laterally spaced array by at least one spacer assembly with a multiplicity of intersecting slotted grid plates that form first cells through which the fuel elements are inserted and second cells through which the guide tubes are inserted, an improved arrangement for restraining spacer assembly movement comprising: guide tube sleeves circumscribing and fixedly connected to the guide tubes, each guide tube sleeve positioned so as to completely circumscribe the guide tube within each guide tube cell and partly beyond each guide tube cell, said guide tube sleeve portion extending beyond said guide tube cell completely connected to the circumference of said guide tube by welding, each sleeve having at least one aperture in the portion thereof extending beyond the guide tube cell; a plurality of collars; said collars having at least one longitudinal slot therein for mechanically interlocking each collar with a portion of the grid plates defining a respective guide tube cell by passing a grid plate within said slot; each of the collars circumscribing completely part of a guide tube sleeve, and each of said collars being crimped in part to extend into at least one aperture of said sleeves.

4,294,661

LIQUID METAL COOLED FAST BREEDER NUCLEAR REACTOR CONSTRUCTIONS

Geoffrey Seed, St. Helens; Graham Chesworth, Lymm; John R. Hind, Warrington, and Donald Hodgson, Ormskirk, all of England, assignors to Nuclear Power Company Limited, England

Filed Apr. 4, 1979, Ser. No. 26,819
Int. Cl.³ G21C *13/00*
U.S. Cl. 376—363 **6 Claims**

1. A liquid metal cooled fast breeder nuclear reactor construction comprising:

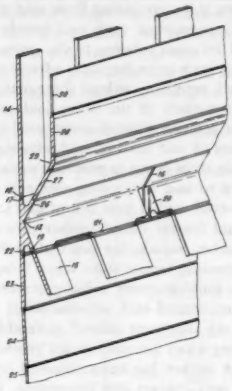
a concrete containment vault,

a primary vessel containing a pool of liquid alkali metal coolant housed within the vault,

a nuclear fuel assembly support strongback within the primary vessel, and

a nuclear fuel assembly submerged in the pool of coolant and supported by the strongback,

the primary vessel incorporating a yoke comprised of a plurality of arcuate segments welded end-to-end to form an annular support member, the yoke being suspended from the roof structure of the vault by a first annular series of tie straps disposed outside the primary vessel whilst the strongback is supported from the yoke by a second annular series of tie straps, the yoke having upwardly and



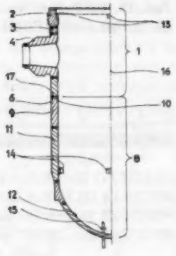
downwardly extending legs which are extended by upper and lower strakes respectively of the primary vessel.

4,294,662

PROCESS FOR THE FINAL ASSEMBLY OF A NUCLEAR REACTOR VESSEL

Paul Guignard, Le Creusot, and Alain Commeau, Montchanin, both of France, assignors to Framatome, Courbevoie, France

Filed May 12, 1980, Ser. No. 150,224
Claims priority, application France, May 16, 1979, 79 12399
Int. Cl.³ B23K *31/06*
U.S. Cl. 219—61 **5 Claims**



1. A process for the final assembly of a nuclear reactor vessel comprising two sub-assemblies possessing symmetry of revolution, which sub-assemblies have been assembled and machined to provide elements for positioning the internal fitments of the vessel and which have been provided with annular mating surfaces in planes perpendicular to said axes of symmetry of said sub-assemblies and with assembly ridges projecting from each said mating surface at a median part of said surface and extending over the complete perimeter of said surface, said process comprising arranging said sub-assemblies with said axes thereof horizontal and with said mating surfaces thereof facing, bringing said ridges into contact and coincidence thereby defining two annular spaces between said mating surfaces, one said space opening into the interior of said vessel and the other said space opening into the exterior over the whole periphery of said vessel, said spaces being separated by a wall formed by said contacting ridges, initially welding said sub-assemblies by deposition of a filler metal in one of said spaces, removing by machining said ridges and part of said deposited metal, and finally welding said sub-assemblies by

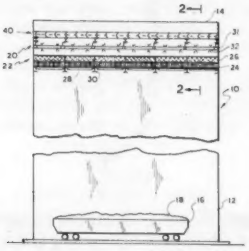
deposition of filler metal in said annular spaces between said mating surfaces, said process additionally comprising providing at the level of one of said annular spaces at least three female centering stubs projecting from said mating surface of one of said sub-assemblies, each said female stub having an associated seat recessed relative to the outer surface of said stub, said female stubs extending over a fraction of said perimeter of said vessel, providing at least three male centering stubs on said mating surface of the other said sub-assembly, the shape, size and position thereof corresponding to the shape, size and position of said seats of said female stubs, said male stubs and female stubs being in positions matched in a precise manner relative to said positioning elements for internal fitments of said vessel, and at least one of said male stubs and at least one of said female stubs together providing a radially directed key socket, introducing said male stubs into said seats of said corresponding female stubs when bringing said ridges into contact to simultaneously achieve centering, axial alignment and orientation of said sub-assemblies relative to one another, checking alignment thereof preferably by an optical method, inserting a key into said socket provided by said pair of stubs, which socket has been obtained by bringing said sub-assemblies into contact and orientation, to maintain the relative positioning of said sub-assemblies, joining said stubs together by point-welds before effecting initial welding, and, after initial welding, removing said male and female stubs by machining when removing said ridges and before completely filling said annular spaces with filler metal.

4,294,663

METHOD FOR OPERATING A COKE QUENCH TOWER SCRUBBER SYSTEM

Richard P. Tennyson, Fort Myers, Fla., assignor to Munters Corporation, Fort Myers, Fla.

Filed Jun. 18, 1980, Ser. No. 160,744
Int. Cl.³ C10B *39/08;* B01D *47/00*
U.S. Cl. 201—39 **8 Claims**



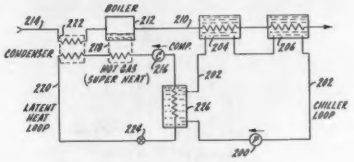
1. The method of quenching coke and scrubbing the resulting gases comprising the steps of placing a supply of hot coke in an enclosed natural draft tower having an open top, passing water from above to said coke through at least one layer of a liquid gas contact body formed of corrugated sheets of materials arranged with the corrugations in each adjacent sheet crossing each other, passing gases from the quenched coke through said contact body countercurrent to said water to remove particulate matter, liquid drops and water soluble vapors from said gases in said contact body, the pressure drop across the contact body being on the order of 0.15 inches w.g., and thereafter passing said gases through a mist eliminator structure to remove water droplets therefrom, the pressure drop across the mist eliminator being on the order of 0.10 inches w.g.

4,294,664

LATENT HEAT RECIRCULATING SYSTEM

Myron L. Anthony, Grand Junction, Colo., assignor to Sax Zzyzx, Ltd., Clifton, Colo.

Filed Jul. 16, 1980, Ser. No. 169,441
Int. Cl.³ B01D *3/02, 3/22*
U.S. Cl. 203—19 **11 Claims**



1. A method of conserving energy while processing a process liquid in a process stream to recover its latent heat of condensation for return to the process stream and comprising the following steps:

(1) providing an open process stream having a first heat accepting means and a first heat rejecting means;

(2) providing a closed refrigerator loop having second heat accepting means and second heat rejecting means;

(3) providing a closed chiller loop having third heat accepting means and third heat rejecting means;

(4) indirectly exchanging heat between said second heat accepting means and said third heat rejecting means;

(5) indirectly exchanging heat between said first heat rejecting means and said third heat accepting means; and

(6) indirectly exchanging heat between said second heat rejecting means and said first heat accepting means,

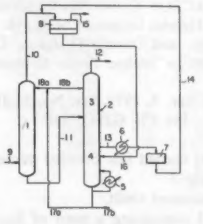
thereby enabling said latent heat to be passed to the chiller loop and from there to the refrigerator loop for exchange back to the process stream, and allowing adjustments to be made in the refrigerator loop for efficiency and performance without necessarily effecting the chiller loop.

4,294,665

SEPARATION OF ACETONITRILE FROM CRUDE OLEFINICALLY UNSATURATED NITRILE

Katsuta Issei, and Tanaka Tetsuo, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1980, Ser. No. 115,865
Claims priority, application Japan, Feb. 2, 1979, 54/11109
Int. Cl.³ B01D *3/00;* C07C *121/32*
U.S. Cl. 203—50 **11 Claims**



1. A process for separating acetonitrile from a crude olefinically unsaturated nitrile which comprises passing a reaction gas obtained in the ammoxidation of propylene or isobutylene through a quenching column, an absorption column with water, an extractive distillation column for the olefinically unsaturated nitrile and a stripping column for acetonitrile successively, condensing the acetonitrile-containing vapor from the top of the stripping column, evaporating the condensed acetonitrile-containing liquid into the waste gas discharged from

the top of the absorption column, subjecting the waste gas containing a gas and a liquid obtained by the evaporation to a vapor-liquid separation subjecting the gas separated thereby to incineration and recycling the liquid thereby separated to a preselected point selected from the group consisting of the bottom of the quenching column, the stripping column and the bottom of the extractive distillation column.

4,294,666

PROCESS FOR THE MANUFACTURE OF 4,4'-DIPHENYL-METHANE DIISOCYANATE AND A MIXTURE OF DIPHENYL-METHANE DIISOCYANATE ISOMERS CONTAINING A SMALL AMOUNT OF URETDIONES AND HYDROLYZABLE CHLORINE

Hans J. Astheimer, Neuhofen; Horst Brandtstaedter, Ludwigshafen; Rainer Ohlinger, Heidelberg, all of Fed. Rep. of Germany; Willy Van Pee, Ekeren; Jaak Van Steen, Wuustwezel, both of Belgium; Friedrich Sauer, Obersuelzen, Fed. Rep. of Germany; Rudolf Schmidt, Frankenthal, Fed. Rep. of Germany, and Siegfried Krueger, Speyer, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 15, 1980, Ser. No. 178,673

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1979, 2933601

Int. Cl.[3] **B01D** *3/10;* **C07C** *119/048*

U.S. Cl. 203—72 **6 Claims**

1. A process for the manufacture of a mixture of diphenylmethane diisocyanate isomers and particularly 4,4'-diphenylmethane diisocyanate containing a small amount of uretdiones and hydrolyzable chlorine by the distillation of a mixture of crude MDI, diphenylmethane diisocyanate isomers and polyphenylene polymethylene polyisocyanates, which comprises:

A. feeding crude MDI into an evaporator at temperatures of 175° C. to 210° C. under reduced pressure,

B. discharging a non-distilled bottom fraction of from 97 weight percent to 50 weight percent based on the feed amount of crude MDI,

C. evaporating a head fraction of from 3 weight percent to 50 weight percent based on the feed amount of crude MDI,

D. condensing from the head fraction a fraction I of from 90 weight percent to 99 weight percent based on the feed amount of the head fraction, in a condensation stage I, at a temperature of from 130° C. to 170° C., the fraction I containing at least 96 weight percent, based on the weight of fraction I, of diphenylmethane diisocyanate isomers, less than one weight percent, based on the weight of fraction I, of uretdiones and less than 50 ppm based on the weight of fraction I of hydrolyzable chlorine, and

E. condensing the remaining 10 weight percent to one weight percent, based on the feed amount of head fraction, in a condensation stage II at a temperature of from 45° C. to 60° C.

4,294,667

CORROSION EVALUATION TESTING METHOD OF COATED METALLIC MATERIAL AND APPARATUS EMPLOYED THEREFOR

Takashi Yamamoto, Kyoto, and Hiroshi Amako, Hirakata, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Mar. 14, 1980, Ser. No. 130,443

Claims priority, application Japan, May 10, 1979, 54-57868

Int. Cl.[3] **G01N** *27/30, 27/46*

U.S. Cl. 204—1 T **28 Claims**

1. A method of testing coated metallic material for corrosion, comprising the steps of:

(a) providing a metallic specimen plate having a film face coated by a film of paint and bringing the film face in contact with a corrosive test medium;

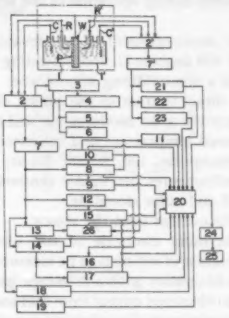
(b) detecting the plate's spontaneous electrode potential with respect to the corrosive medium and potentiostatically electrolyzing said film face at said spontaneous electrode potential;

(c) selectively pulse polarizing said film face by cathodic-anodic voltage and computing the existence or non-existence of a film defect from the polarizing voltage and detected induced polarization current;

(d) selectively sweep polarizing said film face by a linear positive and negative potential sweep to induce a sweep polarization current;

(e) responding to the computation of non-existence of a film defect in step (c) by

(i) selectively pulse polarizing said film face by small



voltage cathodic-anodic pulses and computing the film face's film resistance from the polarizing pulses and detected induced pulse polarization current; said

(ii) selectively subtracting a current correction portion, computed as caused by the film resistance, from said sweep polarization current to detect a comparatively very small current-potential variation and from this very small current-potential variation computing the specimen's corrosion current; and

(f) responding to the computation of existence of a film defect in step (c) by detecting said sweep polarization current to selectively form cathodic polarization curves and anodic polarization curves.

4,294,668

METHOD OF MEASURING OXYGEN AND PROCESS FOR PRETREATING A SOLID ELECTROLYTE OXYGEN GAS SENSING ELEMENT

Ching T. Young, Troy, Mich., assignor to Bendix Autolite Corporation, Fostoria, Ohio

Division of Ser. No. 942,102, Sep. 13, 1978, abandoned. This application Jun. 12, 1980, Ser. No. 158,843

Int. Cl.[3] **G01N** *27/58*

U.S. Cl. 204—1 T **13 Claims**

1. A process for pretreating a solid electrolyte oxygen gas sensor element so as to increase the voltage output under rich gas conditions, shorten the switching response time, and reduce the internal resistance thereof, the sensor element comprising a solid electrolyte body having an inner conductive catalyst electrode on the inner surface, that is to be in contact with a reference gas during operation of the sensor, an outer conductive catalyst electrode coating on the outer surface thereof, that is to be in contact with a gas, the oxygen content of which is to be measured during operation of the sensor, and a porous protective coating over at least a portion of said outer electrode, comprising:

(a) heating the sensor element to an elevated temperature in excess of 450° C. and subjecting the outer surface thereof, with said outer conductive catalyst coating, to a nonoxidizing atmosphere; and

(b) applying a direct current to the sensor element, with said outer electrode as an anode, while said outer surface is at

said elevated temperature and subjected to said nonoxidizing atmosphere, the current density thereof being at least 5 milliamperes per square centimeter of the planar surface of said outer conductive catalyst electrode.

10. The solid electrolyte oxygen gas sensor element pretreated according to the process of claim 1.

13. A method for measuring the oxygen content of a gas with a solid electrolyte oxygen gas sensor element comprising a solid electrolyte body, an inner electrode on the inner surface, that is to be in contact with a reference gas during operation of the sensor, and an outer electrode on the outer surface, that is to be in contact with a gas, the oxygen content of which is to be measured during operation of the sensor, said method comprising:

heating the sensor element to an elevated temperature in excess of 450 degrees C. and subjecting the outer surface thereof to a non-oxidizing atmosphere;

applying a direct current to the sensor element, with said outer electrode as an anode, while said outer surface is at said elevated temperature and subjected to said non-oxidizing atmosphere, the current density thereof being at least 5 milliamperes per square centimeter of the planar surface of said outer electrode;

removing the current from the sensor;

exposing the outer electrode of said sensor to a gas the oxygen content of which is to be measured, with the inner electrode in contact with a reference gas; and

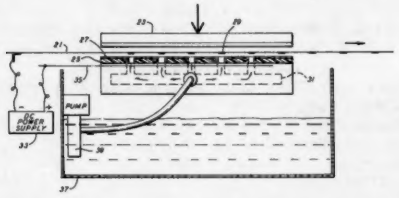
measuring an electrical output from said sensor electrodes as a measure of the oxygen content of in said gas.

4,294,669

PROCESS FOR PLATING SELECTED METAL AREAS

Howard P. Lincoln, North Warren, and Donald M. Reddinger, Russell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1980, Ser. No. 185,091
Int. Cl.[3] C25D *5/02*
U.S. Cl. 204—15 **3 Claims**



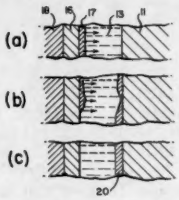
1. In a process for plating selected areas of a metal wherein a rigid plate covered with a resilient material is placed in contact with one surface of the metal and a plating solution is energized and applied to the selected areas of the opposite surface of the metal, the improvement comprising the steps of contacting the opposite surface of the metal with an apertured mask comprising a mask blank having a plurality of apertures and having a layer of polyurethane on one surface for forming a seal with said metal, a layer of polyurethane affixed to the inner periphery of the apertures of said apertured mask, and a layer of polyurethane in a recessed portion of an opposite surface of said apertured mask blank surrounding each one of said apertures and applying said plating solution to said selected areas of said metal through said apertures of said apertured mask.

4,294,670

PRECISION ELECTROPLATING OF METAL OBJECTS

Louis W. Raymond, 2500 Post Rd., Fairfield, Conn. 06430

Filed Oct. 29, 1979, Ser. No. 89,589
Int. Cl.[3] C25D *7/04, 17/10*
U.S. Cl. 204—26 **5 Claims**



1. In the process for the precision electroplating of a layer of metal of predetermined uniform thickness on the surface of a metal object in which an anode comprising the source of the metal being electroplated on the surface of the metal object is positioned in close proximity to said surface with the facing surfaces of the anode and the metal object spaced a predetermined uniform distance apart, in which the space between said facing surfaces of the anode and the metal object being electroplated is filled with an aqueous electrolyte containing a cation of the electroplating metal and in which an electrolyzing current is passed through said aqueous electrolyte between the facing surfaces of the anode and the object being electroplated to cause the electroplating metal of the anode to be electrolytically dissolved in the aqueous electrolyte and to cause an exactly equal amount of said metal to be electrolytically deposited on said facing surface of the metal object being electroplated, the improvement which comprises:

employing a composite anode having an under body of generally electrically conductive but anodically non-conductive material on the surface of which under body is disposed an outer layer of the metal being electroplated on the surface of the metal object, said outer layer of electroplating metal of the anode initially being of predetermined uniform thickness and completely covering the surface of the under body of the anode that immediately faces the surface of the metal object being electroplated, and

continuing the electroplating operation to effect the complete electrolytic dissolution of the outer layer of electroplating metal of the anode, the complete removal of said outer layer of electroplating metal from any given area of the anode under body automatically terminating the flow of electrolyzing current from that area of the anode with the concomitant termination of the electrodeposition of said metal onto the corresponding area of the metal object being electroplated, whereby a layer of metal of predetermined uniform thickness is electroplated onto the surface of said metal object.

4,294,671

HIGH TEMPERATURE AND LOW FEED ACID CONCENTRATION OPERATION OF HCL ELECTROLYZER HAVING UNITARY MEMBRANE ELECTRODE STRUCTURE

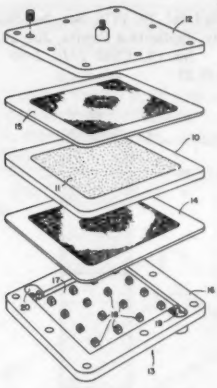
Edward N. Balko, Wilmington, Mass., assignor to General Electric Company, Wilmington, Mass.

Filed May 14, 1980, Ser. No. 149,619
Int. Cl.[3] C25B *1/26, 9/00*
U.S. Cl. 204—128 **13 Claims**

1. A process of generating halogens which comprises,

(a) electrolyzing an aqueous halide between an anode and a cathode electrode separated by a permselective, liquid and gas impervious ion exchanging membrane, said anode being bonded to the membrane to provide a gas and liquid permeable electrode which forms part of a unitary electrode-membrane structure,

(b) applying potential to the anode through a separate electron current conducting structure to introduce electron current flow to the bonded anode at a plurality of discrete areas on the surface of the anode,



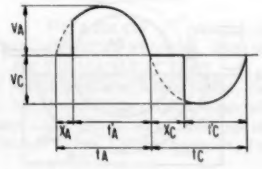
(c) establishing turbulent anolyte flow conditions over the surface of the anode to maintain the chloride ion concentration at the discrete areas of the anode at a level to minimize chloride ion starvation and oxygen evolution at the operating current density to maintain the oxygen content of the evolved halogen below 1%.

4,294,672

METHOD FOR PREPARING A SUPPORT FOR A LITHOGRAPHIC PRINTING PLATE

Hisao Ohba; Kazutaka Oda; Yukio Yabuta, and Azusa Ohashi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 30, 1980, Ser. No. 154,665
Claims priority, application Japan, May 30, 1979, 54-67210
Int. Cl.³ C25F *3/04*
U.S. Cl. 204—129.4 **15 Claims**



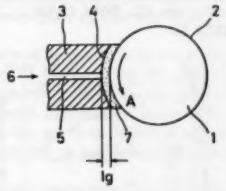
1. A method for preparing a support for a lithographic printing plate comprising electrolytically graining an aluminum plate in an acidic electrolyzing bath, wherein an alternating charge voltage having a wave form which includes at least one intermission period of zero voltage in at least one of the anode or the cathode phases is applied to said plate, and is such that the electric quantity for the anode phase Q_a is larger than the electric quantity for the cathode phase Q_c.

4,294,673

METHOD OF MIRROR-FINISHING A CYLINDRICAL WORKPIECE

Yasuo Kimoto, Fujiidera; Katsunori Tamiya, Kobe; Shoichi Honda, Osaka; Hidehiko Maehata, Toyonaka, and Hiroshi Kamada, Takatsuki, all of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Feb. 22, 1980, Ser. No. 123,648
Claims priority, application Japan, Feb. 24, 1979, 54-20919; Mar. 27, 1979, 54-36618; May 2, 1979, 54-55086; May 2, 1979, 54-55087; Aug. 15, 1979, 54-104313; Aug. 15, 1979, 54-104314; Aug. 15, 1979, 54-104315
Int. Cl.³ C25F *3/16*
U.S. Cl. 204—129.46 **2 Claims**



1. A method of mirror finishing a cylindrical workpiece comprising the steps of:

disposing a plurality of working electrodes oppositely to one surface of said cylindrical workpiece defining a plurality of gaps between said working electrodes and said cylindrical workpiece;

introducing an electrolyte and an abrasive matter into said plurality of gaps, said electrolyte being in a passive state, said abrasive matter being water permeable;

connecting said cylindrical workpiece to the anode of a power supply and said working electrodes to the cathode of said power supply, said power supply providing an electrolytic voltage in a range from 2 volts to 15 volts and an electrolytic current less than or equal to 10 amperes /cm^2;

performing an anodic liquation operation by electrolysis onto a metallic surface of the cylindrical workpiece being treated;

assisting said anodic liquation operation by simultaneously performing an abrasive operation to the metallic surface of the workpiece being treated resulting in the abrasion of an anodic passive film formed on said metallic surface;

the steps of performing an anodic liquation operation and performing an abrasive operation further including the steps of:

swivelling each of said plurality of working electrodes and the cylindrical workpiece relative to one another in a circumferential direction of the cylindrical workpiece, and

simultaneously pressing said working electrodes and the abrasive matter toward the metallic surface of the cylindrical workpiece, the pressing force of said abrasive matter on the surface of the cylindrical workpiece being greater than or equal to 0.5 kgf/cm^2,

the steps of swivelling one of said plurality of working electrodes and said cylindrical workpiece relative to one another and simultaneously pressing said one of said working electrodes and the abrasive matter toward the surface of the cylindrical workpiece providing a speed of abrasion of said abrasive matter across a portion of the metallic surface of the cylindrical workpiece of greater than or equal to 2 meters/second,

a period of time between the steps of swivelling and simultaneously pressing said one of said working electrodes relative to said portion of the metallic surface of the cylindrical workpiece and swivelling and simultaneously pressing an adjacent one of said working elec-

trodes relative to said portion of the surface of the cylindrical workpiece being in a range from 20 milliseconds to 200 milliseconds.

4,294,674

METHOD OF TREATING WASTE GAS BY IRRADIATION

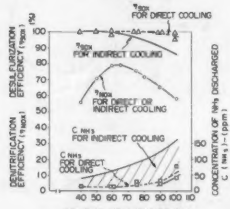
Shinji Aoki, Tokyo; Keita Kawamura; Hitoshi Kimura, both of Fujisawa; Tsutomu Katayama; Chikara Kaido, both of Kitakyushu, and Hiroshi Yoshida, Koganei, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,500

Claims priority, application Japan, Dec. 29, 1978, 53-162153

Int. Cl.³ B01J *19/08*

U.S. Cl. 204—157.1 H **4 Claims**



1. An improved method of treating waste gas containing sulfur oxides and nitrogen oxides and having ammonia added, the waste gases being subjected to ionizing radiation characterized in that the reaction temperature is held between 50° C. and 80° C. during the treatment.

4,294,675

PROCESS FOR PRODUCTION OF FLUORINE-CONTAINING MULTI-COMPONENT COPOLYMERS

Osamu Matsuda; Terutaka Watanabe, both of Takasaki; Yoneho Tabata, Tokyo, and Sueo Machi, Takasaki, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Oct. 16, 1979, Ser. No. 85,328

Claims priority, application Japan, Oct. 18, 1978, 53-128206; Mar. 20, 1979, 54-32962; Mar. 20, 1979, 54-32963; Apr. 27, 1979, 54-52278

Int. Cl.³ C08F *8/00, 214/18, 214/26*

U.S. Cl. 204—159.14 **29 Claims**

1. A process for the cross-linking of fluorine-containing multi-component interpolymer of regular repeating sequential alternating structure of $-A_1-B_1-A_2-B_2-A_3-B_3-$, wherein A_1, A_2 and A_3 represent α-olefin units and B_1, B_2 and B_3 represent α,β,β-trifluoroacrylate or tetrafluoroethylene

formed by copolymerizing by irradiating with ionizing radiation a mixture of tetrafluoroethylene; at least one α,β,β-trifluoroacrylate selected from the group consisting of methyl α,β,β-trifluoroacrylate, ethyl α,β,β-trifluoroacrylate, and butyl α,β,β-trifluoroacrylate; and at least one α-olefin selected from the group consisting of ethylene, propylene, 1-butene, 1-pentene, 1-hexene, 1-heptene, 1-octene, 1-nonene, 1-decene, 1-undecene, 1-dodecene, 1-tridecene, 1-isobutylene, 2-methyl-1-butene, 2-methyl-1-pentene, 2-methyl-1-hexene, 2-methyl-1-heptene and 2-methyl-1-octene;

comprising subjecting said interpolymer to electron beam irradiation in air or in an inert gas.

4,294,676

AQUEOUS MONOMER SOLUTIONS ADAPTED FOR DIRECT PHOTOPOLYMERIZATION

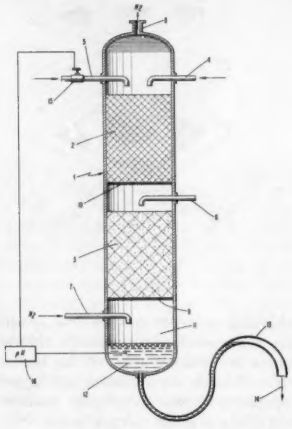
Jean Boutin, Mions; Bernard Guenot, Paris, and Bruno Jamet, Lyons, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 10, 1979, Ser. No. 56,337

Claims priority, application France, Jul. 24, 1978, 78 22883

Int. Cl.³ C08F *2/10, 2/46*

U.S. Cl. 204—159.23 **19 Claims**



1. A process for the preparation of an aqueous monomer solution adapted for direct photopolymerization into water soluble polymers, comprising deoxygenating and countercurrently scrubbing an aqueous solution of olefinically unsaturated hydrophilic monomer with an inert gas in a packed column, and concurrently adding a photopolymerization inducing amount of photoinitiator to said aqueous solution.

4,294,677

METHOD FOR ELECTRODEPOSITING A PROTEIN ONTO AN ION-EXCHANGE MEMBRANE

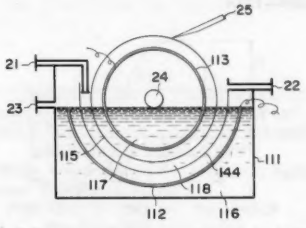
Teruo Sakagami, Iwaki; Tadaaki Kato, Tokyo; Toru Hirai, and Naohiro Murayama, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1979, Ser. No. 74,826

Claims priority, application Japan, Nov. 17, 1978, 53-141863

Int. Cl.³ C25D *1/18, 1/20*

U.S. Cl. 204—181 F **11 Claims**



1. A process for recovering protein from an aqueous solution or suspension containing the protein by electrically depositing the protein on at least one diaphragmatic membrane comprising introducing an aqueous solution of an electrolyte into at least one electrode-chamber formed by an electrode and an ion-exchange membrane as said diaphragmatic membrane, and

electrophoretically moving said protein contained in said aqueous solution or suspension in a chamber adjacent to said electrode-chamber while controlling the pH of the surface of said ion-exchange membrane by creating a difference between the pH of said aqueous solution or electrolyte and the pH of said aqueous solution or suspension whereby said protein is recovered as a film or cylindrical film without bubbling.

4,294,678

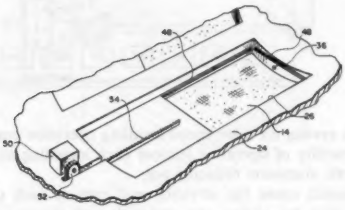
APPARATUS AND METHOD FOR PREVENTING CONTAMINATION OF SPUTTERING TARGETS

Manfred R. Kuehnle, New London, N.H., assignor to Coulter Systems Corporation, Bedford, Mass.

Filed Nov. 28, 1979, Ser. No. 98,223

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **10 Claims**



1. In a sputtering apparatus which comprises a vessel including means for establishing low pressure gas conditions within the vessel and maintaining the interior of the vessel in sealed condition relative to the exterior ambient atmosphere, anode and cathode means within the vessel and the cathode means including at least one target material surface exposed to the interior of the vessel, the anode and cathode means being disposed in such a manner that said target material surface is in face to face relationship with the anode means and spaced therefrom whereby to enable a substrate member to be interposed in said space, means for extending electrical connections from said anode and cathode means to an exterior source of electrical energy, means for establishing and maintaining sputtering conditions within the vessel and means for maintaining a substrate member adjacent to the anode means in said space during the period of time that the sputtering conditions are being maintained within said vessel, the invention herein which comprises:

means for preventing contamination of the target material surface when the vessel is opened to the exterior ambient atmosphere comprising remotely controlled shutter means for selectively sealing off said target material surface from the interior of the vessel and exposing said target material surface to said interior of the vessel.

4,294,679

FLAT ELECTROCHEMICAL SENSOR, AND METHOD OF ITS MANUFACTURE

Helmut Maurer, Schwieberdingen; Klaus Müller, Tamm; Ernst Linder, Mühlacker; Franz Rieger, Aalen-Wasseralfingen, and Günther Stecher, Ludwigsburg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,738

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1979, 2928496

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—195 S **34 Claims**

1. Electrochemical sensor unit for determination of oxygen content in gases, particularly exhaust gases from a combustion process, especially exhaust gases from an internal combustion engine, adapted for support by and in a metallic housing,

said sensor unit being of essentially elongated plate-like form having a sensing end portion adapated for exposure to the gases and a holding end portion adapted for attachment into the housing, and an intermediate portion intermediate said end portions,

said sensor units having a plate carrier element (**11**, **14**; **31**, **32**; **46**; **59**; **71**; **89**; **108**; **112**);

a plate-like solid electrolyte body (**11**; **31**; **46**; **59**; **71**; **89**; **108**; **112**) forming at least in part said carrier element;

a measuring electrode and a reference electrode forming an electrode pair (**12**, **13**; **29**, **30**; **45**, **50**; **60**, **61**; **69**, **70**; **92**, **93**; **108**; **113**, **114**), said electrodes being porous metallic layers located on said electrolyte body, spaced from each other, at least the measuring electrode being adapted to be exposed to the gases to be tested; wherein, in accordance with the invention, at least one of the electrodes is covered with a cover plate (**17**; **36**; **63**, **77**; **83**; **103**; **103'**, **120**), and

to conduct a gas to at least one of the electrodes, depressions, grooves, ducts or flutes (**22**; **94**, **94'**; **115**) are formed between the respective electrode and at least one of said cover plates said depressions, grooves, ducts or flutes being open to the gas to be admitted and dimensioned to control the quantity of gas being admitted to the respective electrode.

22. Method to make an electrochemical sensor unit, for the determination of oxygen content in gases, particularly exhaust gases from a combustion process and especially exhaust gases from an internal combustion engine, adapted for support in a metallic housing, said sensor unit being essentially of elongated

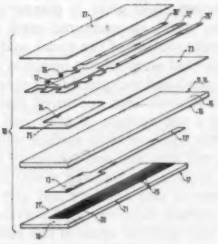


plate-like form having a sensing end portion adapted for exposure to the gases, a holding end portion adapted for attachment in the housing, and an intermediate portion intermediate said end portions,

said sensor unit having a plate-like carrier element;

a plate-like solid electrolyte body forming at least in part said carrier element;

a measuring electrode and a reference electrode forming an electrode pair, said electrodes being porous metallic layers located on said electrolyte body, spaced from each other, at least the measuring electrode being adapted to be exposed to the gases to be tested;

and at least one cover plate element covering at least one of the electrodes,

and wherein the sensor is characterized in that ducts or flutes are formed between a respective electrode and at least one of said elements, said ducts or flutes being open to a gas to be admitted and dimensioned to control the quantity of gas being admitted to the respective electrode to conduct the gas thereto,

said method comprising the steps of

(a) applying the electrodes (**92**,**93**) on the carrier (**89**); then

(b) applying projecting elements (**100**, **100/1**; **99**, **99'**) of a gas-impervious material capable of being sintered on at least one of the electrodes and at least portions of the carrier (**89**), said projecting elements defining the grooves or flutes therebetween; then

(c) applying a filler material in the grooves or flutes which, upon a sintering process, is volatile or dissolvable; then

(d) applying a cover (**103, 103'**) of a gas-impervious material capable of being sintered on the surface formed by the projecting elements and the filler material; then

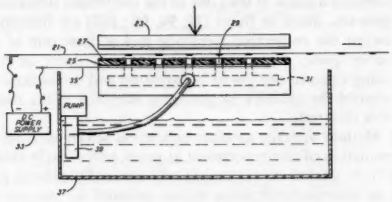
(e) sintering said sensor unit to unite the components thereof to sinter together the projecting elements and the cover and evaporate or dissolve and filler to leave the grooves or flutes free.

4,294,680

APPARATUS FOR SELECTIVE METAL PLATING

Howard P. Lincoln, North Warren, and Donald M. Reddinger, Russell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1980, Ser. No. 185,092
Int. Cl.³ C25D *17/00*
U.S. Cl. 204—224 R **4 Claims**



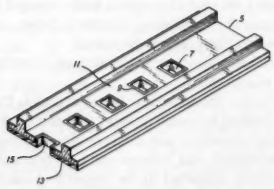
1. In apparatus for plating selected areas of a metal wherein a rubber-covered rigid plate is placed in contact with one surface of the metal, an apertured mask is placed in contact with an opposite surface of the metal, and a plating solution is applied to selected areas of the opposite surface of the metal through said mask and energized for a given period of time, the improvement wherein said apertured mask comprises a mask blank having a top surface, at least one aperture having an inner perimeter, and a bottom surface with a recessed portion surrounding said aperture and a layer of polyurethane covering said top surface for forming a seal with said metal, said inner perimeter of said aperture and said recessed portion of said bottom surface whereby said polyurethane forms a seal surrounding said selected areas of the metal.

4,294,681

MOLDED SELECTIVE PLATING MASK

Howard P. Lincoln, North Warren, and Donald M. Reddinger, Russell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1980, Ser. No. 185,094
Int. Cl.³ C25D *17/00*
U.S. Cl. 204—224 R **10 Claims**



1. A mask for selectively plating specific areas of a metal comprising:

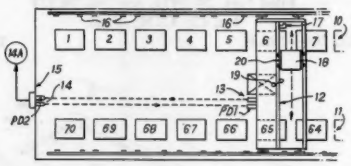
a mask blank having a plurality of apertures therein for alignment with said specific areas for selective plating of said metal with each of said apertures surrounded by a recessed portion of said mask blank on one surface thereof; and a layer of polyurethane covering a surface opposite said one surface of said mask blank for forming a seal with said metal, said recessed portion of said one surface of said mask blank, and the inner perimeter of each aperture in said mask blank.

4,294,682

DATA ACQUISITION SYSTEMS

Andrew E. Deczky, Ottawa, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Jan. 31, 1977, Ser. No. 764,167
Claims priority, application Canada, Jan. 29, 1976, 244504
Int. Cl.³ H04B *9/00*; G06K *15/20*
U.S. Cl. 204—244 **14 Claims**



1. A system for a hot metal handling operation comprising:

a plurality of operating stations each including an electrolytic aluminum reducing pot;

a mobile crane for servicing said pots at each operating station by adding raw materials and removing molten metal;

a data acquisition system comprising:

means associated with the crane for providing identification information of a particular pot and pot row being serviced;

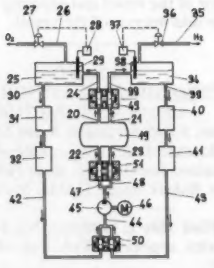
means associated with the crane for measuring process variables at each operating station; and means on the crane for optically transmitting said identification information and said information concerning the measurements over a cableless path from said crane to a receiver and computer located remotely of said operating stations.

4,294,683

ELECTROLYSIS UNIT

Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France

Filed Mar. 31, 1980, Ser. No. 136,099
Claims priority, application France, Apr. 2, 1979, 79 08694
Int. Cl.³ C25B *9/00, 15/08*
U.S. Cl. 204—258 **10 Claims**



1. Electrolysis unit comprising at least one electrolyzer provided with at least one anolyte outlet and at least one catholyte outlet, a degasser for each of said outlets, a circuit connecting each degasser to its respective outlet, means for controlling the flow of electrolyte in each connecting circuit means, each for controlling the flow of anolyte being coupled

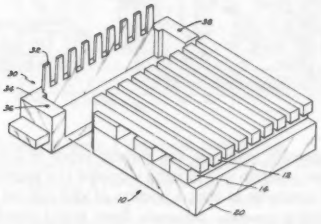
to the corresponding means for controlling the flow of catholyte, and vice versa, by a coupling connection producing concomitant variations in these two flow-control means and an electrolyte return circuit leading from each degasser, said return circuits being connected together at a point upstream of the electrolyzer.

4,294,684

TEMPLATE FOR FORMING MULTIPLE GEL TRACKS WITHIN A SINGLE ELECTROPHORETIC GEL FRAME

Philip Serwer, San Antonio, Tex., assignor to Board of Reagents, University of Texas, Austin, Tex.

Filed Jun. 30, 1980, Ser. No. 164,274
Int. Cl.³ G01N *27/28*
U.S. Cl. 204—299 R **9 Claims**



1. A template for forming multiple gel tracks in a gel bed, which comprises:

a support frame;

a plurality of rigid elongate bars, each bar spaced a sufficient distance from an adjacent bar effective to form gel tracks in a gel bed. each bar of which is securely attached to the support frame in a parallel alignment with respect to the other bars; and

a sample-well forming comb having a plurality of teeth projecting linearly from a base, said comb adapted to be detachably disposed with respect to the support frame, the teeth of the comb aligned in a manner to form a flush contact with one set of ends presented by the elongate bars.

4,294,685

PROCESS FOR COAL LIQUEFACTION AND CATALYST

Dae K. Kim, Naperville; Ralph J. Bertolacini, Chesterton; L. Charles Gutberlet, Wheaton, and Ken K. Robinson, St. Charles, all of Ill., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 20,209, Mar. 13, 1979, Pat. No. 4,257,922. This application Jul. 7, 1980, Ser. No. 166,552
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—10 **8 Claims**

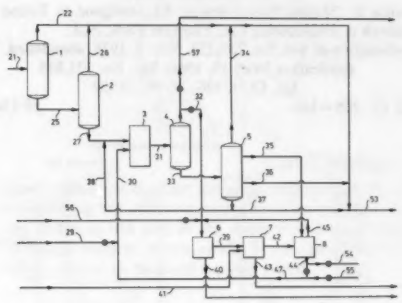
1. An improved process for hydroconversion of coal solids to liquid and gaseous products comprising contacting the coal solids, a gas containing molecular hydrogen and catalyst solids in a coal reaction zone at elevated temperatures and pressures at which a major portion of said coal solids undergo hydroconversion to gaseous and liquid products, the improvement comprising using, as catalyst solids, a supported catalyst comprising a catalytically active substance on support particles, said particles having essentially bimodal pore distribution with peak concentrations of smaller pores below about 600 angstroms and larger pores above about 600 angstroms, with the average diameter of the smaller pores ranging from about 100–200 angstroms, and the average diameter of the larger pores being in excess of 1000 angstroms said catalyst including at least 5.0% of the total pore volume of the larger pores and at least 70.% of the total pore volume of the smaller pores.

4,294,686

PROCESS FOR UPGRADING HEAVY HYDROCARBONACEOUS OILS

Ian P. Fisher, Oakville; H. John Woods, Campbellville, and Frank Souhrada, Weston, all of Canada, assignors to Gulf Canada Limited, Toronto, Canada

Filed Mar. 11, 1980, Ser. No. 129,288
Int. Cl.³ C10G *45/28, 47/34*
U.S. Cl. 208—56 **13 Claims**



1. A process for the upgrading of viscous hydrocarbonaceous oils comprising:

(a) fractionally distilling said hydrocarbonaceous oil to produce at least one fraction boiling below a temperature from substantially 300° C. to substantially 570° C. and a residuum boiling above said temperature, without significantly cracking said hydrocarbonaceous oil,

(b) contacting said residuum with a liquid hydrogen donor material stream at hydrocracking conditions to produce a hydrocracked stream,

(c) separating said hydrocracked stream into a gaseous stream and a liquid hydrocracked stream,

(d) fractionally distilling said liquid hydrocracked stream to separate, from lower and higher boiling fractions, a hydrogen donor precursor stream boiling above a temperature from substantially 180° C. to substantially 200° C. and below a temperature from substantially 330° C. to substantially 350° C.,

(e) catalytically reacting said hydrogen donor precursor stream with a hydrogen-rich gaseous stream to produce a hydrogenated donor material, and

(f) recycling at least part of said hydrogenated hydrogen donor material as the material which constitutes the entire liquid hydrogen donor material stream to contact said residuum in step (b) noted above.

4,294,687

LUBRICATING OIL PROCESS

Ronald Pinaire, Park Forest, and Gary L. Everett, Chicago Heights, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 26, 1979, Ser. No. 106,973
Int. Cl.³ C10G *45/00, 47/02, 65/12*
U.S. Cl. 208—58 **29 Claims**

1. A process for preparing a mineral hydrocarbon lubricating oil base stock comprising:

(a) contacting a mineral hydrocarbon oil feedstock of lubricating oil viscosity with molecular hydrogen in the presence of a hydrotreating catalyst under hydrotreating conditions to avoid undue cracking of said feedstock such that less than about 5% by volume of said feedstock is cracked to produce materials boiling below about 600° F.;

(b) contacting the effluent oil from step (a) with molecular hydrogen in the presence of a hydrocracking catalyst under hydrocracking conditions; and

(c) contacting the effluent oil from step (b) with molecular hydrogen in the presence of a hydrogenation catalyst under hydrogenation conditions such that less than about 5% by volume of said effluent oil from step (b) which boils above 600° F. is cracked to produce material boiling below about 600° F.

4,294,688

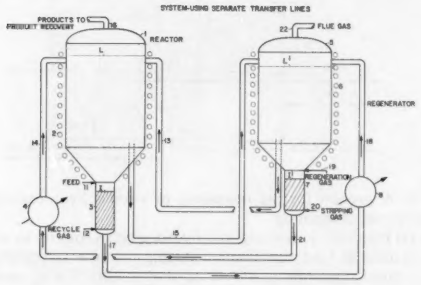
HEAT TRANSFER IN MAGNETICALLY STABILIZED, FLUIDIZED BEDS

Francis X. Mayer, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 737,227, Nov. 1, 1976, abandoned. This application Mar. 19, 1980, Ser. No. 131,855

Int. Cl.³ C10G *11/00, 15/00*

U.S. Cl. 208—164 **10 Claims**



1. A hydrocarbon conversion process which comprises (a) contacting a hydrocarbon feedstock in a conversion zone having a magnetic field applied thereto with a fluidizable particulate solids mixture containing a plurality of separate discrete substantially inert heat carrier particles and magnetizable catalyst particles, said substantially inert heat carrier particles having settling rates higher than the settling rates of said catalyst particles; (b) permitting said heat carrier particles to settle in preference to the catalyst particles in a settling zone communicating with said conversion zone; (c) circulating said catalyst particles from the conversion zone to a regeneration zone having a magnetic field applied thereto; (d) circulating said heat carrier particles from the settling zone to said regeneration zone, said circulation of heat carrier particles being independent of the circulation of catalyst particles; (e) contacting said catalyst particles in the presence of said heat carrier particles with oxygen at elevated temperatures to burn coke deposited upon said catalyst particles; (f) permitting said heat carrier particles to settle in preference to the catalyst particles in a settling zone communicating with said regeneration zone; (g) circulating said catalyst particles from the regeneration zone to a conversion zone having a magnetic field applied thereto; and (h) circulating said heat carrier particles from the settling zone to said reaction zone, said circulation of heat carrier particles being independent of the circulation of catalyst particles.

4,294,689

SOLVENT REFINING PROCESS

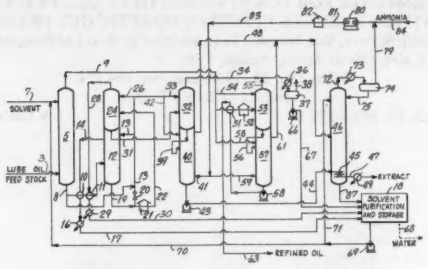
Avilino Sequeira, Jr., Port Arthur; Benjamin F. Smith, Jr., Groves, and Theodore C. Mead, Port Neches, all of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,571

Int. Cl.³ C10G *21/20*

U.S. Cl. 208—326 **4 Claims**

1. In a process for solvent refining a lubricating oil feedstock wherein said lubricating oil feedstock is contacted with N-methyl-2-pyrrolidone as selective solvent for aromatic constituents of said feedback in an extraction zone thereby forming an extract phase rich in said aromatic constituents and comprising a major portion of said solvent and a non-aromatic raffinate phase comprising a minor portion of said solvent, said raffinate phase is separated from said extract phase, and solvent is removed from each of said phases by flash vaporization, distillation, rectification, or a combination thereof, the improvement which comprises stripping residual solvent from said extract and from said raffinate with gaseous ammonia thereby forming a mixture of gaseous ammonia and solvent vapor, passing said



mixture of gaseous ammonia and solvent vapor to a solvent recovery zone wherein said mixture is cooled to a temperature sufficient to condense at least a portion of said solvent therefrom, separating gaseous ammonia from liquid condensate solvent, returning said condensate solvent to said extraction zone, and passing gaseous ammonia from which solvent has been removed into contact with said extract and said raffinate as said stripping gas for the removal of solvent therefrom.

4,294,690

PROCESS FOR SEPARATING WEAKLY MAGNETIC ACCOMPANYING MINERALS FROM NONMAGNETIC USEFUL MINERALS

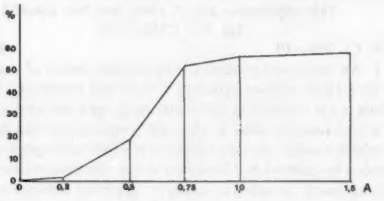
Erich Kollenz, Leoben, Austria, assignor to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Apr. 2, 1980, Ser. No. 136,708

Claims priority, application Austria, May 31, 1979, A3984/79

Int. Cl.³ B03C *1/00*

U.S. Cl. 209—3 **6 Claims**



1. A process for separating minerals having a mass susceptibility of below 200×10^{-6} cm³/g from useful minerals or ores which are nonmagnetic or less magnetic than the minerals to be separated therefrom comprising the steps of:

crushing said minerals or ores to a grain size no greater than 0.2 mm; and

separating said minerals in a magnetic separator having a strong magnetic field.

4,294,691

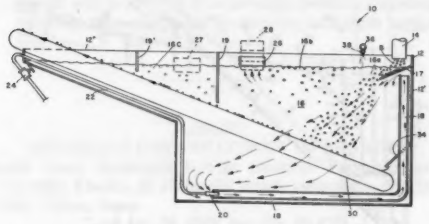
HYDRODYNAMIC BLUEBERRY SORTING

Albert W. Patzlaff, South Haven, Mich., assignor to Blueberry Equipment, Inc., South Haven, Mich.

Continuation of Ser. No. 962,381, Nov. 20, 1978, Pat. No. 4,225,424. This application Jan. 7, 1980, Ser. No. 110,259 The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.

Int. Cl.³ B07C *5/02*

U.S. Cl. 209—3.1 **4 Claims**



1. Blueberry sorting apparatus comprising:

a water bath vessel having a receiving and immersion zone for receiving a harvested mixture of green, partially ripe, and ripe blueberries in the water bath; means for causing a downward current of water at said receiving and immersion zone for entraining and immersing the mixture of berries into the water bath whereby air bubbles are separated from berries to decrease their buoyancy, while green berries rise and float; a perforate conveyor in the path of said downward current to allow water flow therethrough while retaining ripe and partially ripe berries thereon; and means forming a quiescent zone in said water bath vessel, and said conveyor extending through said quiescent zone to allow partially ripe berries to rise to the bath surface and separate from the ripe berries remaining on said conveyor; said current causing means being at one upper side of said vessel, including water oulet means for propelling water into the bath, and oriented to cause said current to be directed smoothly and continuously downwardly toward the opposite lower side of said vessel; water inlet means beneath said conveyor for receiving water after flow through said conveyor; and conduit means for returning water from said water inlet means to said water outlet means.

4,294,692

DRUM-TYPE SCREENING MACHINE AND METHOD OF OPERATION

Alois Keller, Uzwil, Switzerland, assignor to Gebrueder Buehler AG, St. Gallen, Switzerland

Continuation of Ser. No. 934,022, Aug. 16, 1978, abandoned, which is a division of Ser. No. 873,896, Jan. 31, 1978, Pat. No. 4,222,864. This application May 1, 1980, Ser. No. 145,834

Claims priority, application Switzerland, Feb. 3, 1977, 1349/77

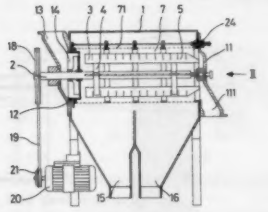
Int. Cl.³ B07B *1/20, 1/48*

U.S. Cl. 209—300 **16 Claims**

1. A method of operating a drum type separator of the type having a stationary tubular screen, opposed support means for supporting the screen at opposite ends thereof and a rotor for causing movement of ground stock to be filtered, comprising the steps of:

supplying ground stock to be sieved through an inlet opening to the interior of the tubular screen while operating the rotor to cause movement of the ground stock such that the finer product passes through the stationary tubular screen and through a first outlet while the coarser product passes out a second outlet without having passed through the tubular screen,

and, while the rotor is rotating and while product is being delivered to and through the separator, operating an adjusting means accessible exteriorly of the separator to vary the distance between the opposed support means to vary the tension of the tubular screen, one of the opposed support means being fixed axially and the other being



axially moveable in either direction, and wherein the step of operating the adjusting means includes turning a turning means at one end of the drum to move the axially moveable support means axially in one direction or the other relative to the fixed support means.

4,294,693

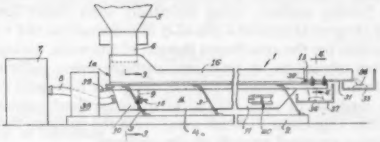
AIR FLOTATION ORE ENRICHING APPARATUS

Ray A. Brennan, Rte. 1, Box 575, Lake Geneva, Wis. 53147

Filed Dec. 8, 1980, Ser. No. 214,085

Int. Cl.³ B03B *4/00*

U.S. Cl. 209—466 **10 Claims**



1. In a flotation ore enriching apparatus including a classification trough having an air-diffusing floor composed of interstitially cellular ceramic material having spaced riffle traps in the top surface thereof, a plenum chamber subjacent and opening to said floor to supply flotation air thereto, means for continuously supplying air under pressure to said plenum chamber, means for continuously supplying pulverized gangue and value ore mixture to be enriched to the inlet end of said classification trough, and means for controlling the flow of flotation air to said classification trough, the improvement wherein said means for continuously supplying air consists of a positive blower, said plenum chamber contains a partition defining within said chamber an inlet plenum located subjacent the inlet end of said trough and a classification plenum subjacent the remainder of said trough downstream from said inlet end thereof, said blower being connected to discharge only into said inlet plenum, said means for controlling the flow of air consisting essentially of an adjustable bleeder valve in a wall of said classification plenum to control the total volume of air forced through said air-diffusing floor and adjustable valve means in said partition to impede the flow of air from said inlet plenum to said classification plenum to maintain a high pressure in said inlet plenum sufficient to force sufficient air through said inlet end of said trough to impregnate and suspend the ore as it is being fed to said trough while maintaining by means of said bleeder valve a relatively low pressure in said classification plenum.

4,294,694

ANAEROBIC FILTER

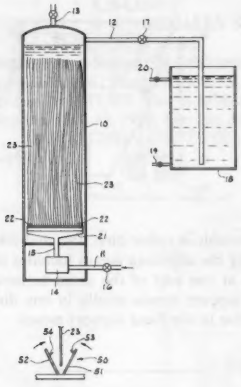
John L. Coulthard, 16 Newry St., Richmond, Victoria, Australia

Filed Mar. 26, 1979, Ser. No. 24,083

Claims priority, application Australia, Mar. 28, 1978, PD3787

Int. Cl.³ C02C *1/04*

U.S. Cl. 210—150 **6 Claims**



1. A biological filter for the treatment of a liquid medium comprising: a tank having an inlet and an outlet, the inlet of the tank being arranged to be connected to a source of polluted liquid medium, whereby said medium can flow through the tank; means for sealing said tank sufficiently to effect anaerobic conditions in said tank; an array of a plurality of vertically elongated strips of plastics material disposed in the tank and randomly floating in the liquid medium present in the tank, said strips having surfaces along essentially their entire lengths which are provided with a plurality of indentations and which are suitable for the attachment thereto of anaerobic biologically-active organisms, at least said surfaces being sufficiently flexible to move randomly so as to cause the flow path of the liquid medium to vary and so as to cause dead clusters of anaerobic organisms to break away from the surfaces thereby permitting renewed growth on the surfaces.

4,294,695

MULTI-PHASE SEPARATION METHODS AND APPARATUS

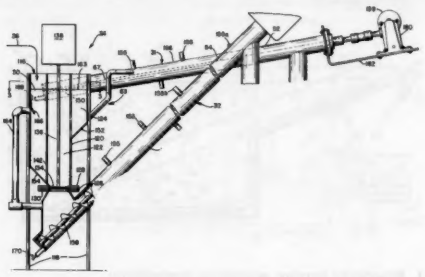
Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 662,888, Mar. 1, 1976, Pat. No. 4,055,480, which is a continuation-in-part of Ser. No. 460,558, Apr. 12, 1974, Pat. No. 3,941,679, and Ser. No. 561,168, Mar. 24, 1975, Pat. No. 4,173,530, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Jul. 8, 1977, Ser. No. 814,040

Int. Cl.³ B01D *17/02, 11/02, 45/02*

U.S. Cl. 210—173 **11 Claims**

1. Apparatus for resolving a composite composed of a first, soluble phase and second and third phases of insoluble solids into the phases of which it is composed, said apparatus comprising: an extractor in which a solvent extraction of said first phase from said composite and a gravity separation of the second insoluble phase of said composite from the third insoluble phase thereof can concurrently be effected; means for introducing the composite into the extractor; means in said extractor for effecting said solvent extraction and said gravity separation which includes a body of a liquid which is comprised of a solvent for said first phase of the composite and which has a specific gravity intermediate those of the solids respectively making up the insoluble second and third phases of said composite, whereby: said first phase of the composite introduced into the extractor will dissolve in said body of liquid isolating said first phase and freeing the solids making up the insoluble second and third phases; the solids making up one of said insoluble phases will then migrate toward the top of said body of liquid; and the solids making up the other of the insoluble phases will sink to the bottom thereof, thereby effecting a separation in said extractor of said three phases, each from the other; means for introducing into said extractor a solvent as aforesaid; offtake means for removing from said extractor solvent as aforesaid and that material making up the



first phase of the composite which is dissolved therein; a first solids transfer means for removing from said extractor independently of said first phase solids which have a specific gravity lower than that of the liquid in the extractor and therefore tend to collect in the upper part of the body of liquid therein; and a second solids transfer means for removing from said extractor solids which have a specific gravity higher than the specific gravity of said liquid and therefore tend to collect in the lower part of said body of liquid.

4,294,696

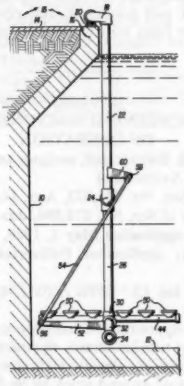
SWING DIFFUSER

Paul M. Thayer, Shorewood, Wis., assignor to Water Pollution Control Corporation, Milwaukee, Wis.

Filed Jan. 25, 1980, Ser. No. 115,470

Int. Cl.³ C02F *3/20*; B01F *3/04*

U.S. Cl. 210—220 **12 Claims**



1. A swing diffuser apparatus for gas diffuser systems of the type in which diffusers are submerged in a tank of liquids to be treated, said apparatus comprising:

a rigid upper hanger arm;

means for pivoting said upper hanger arm to or adjacent to said tank for movement in a generally upright plane;

a rigid lower hanger arm;

means for pivoting said lower arm to said upper arm for

movement in said generally upright plane or a parallel plane;

an array of gas diffusers pivotably connected to the lower portion of said lower hanger arm, said array having a substantially horizontal operating position when submerged in said liquids; and

means cooperating with said upper hanger arm and said diffuser array for rotating said diffuser array from said substantially horizontal position to an upwardly extending servicing position above the surface of said liquids at the side of said tank, said rotating occurring as said upper hanger arm is pivoted to a servicing position extending upwardly from said means for pivoting said upper hanger arm.

4,294,697

APPARATUS FOR TREATMENT OF SEWAGE

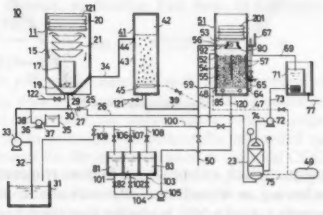
Toshio Sawa; Masayoshi Kubota; Sankichi Takahashi, and Toyohiko Kaneko, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 25, 1979, Ser. No. 60,475

Claims priority, application Japan, Mar. 22, 1979, 54/34592

Int. Cl.³ C02F *1/24*; B03D *1/00*

U.S. Cl. 210—221.1 **12 Claims**



1. An apparatus for the treatment of sewage comprising:

a processing tank having a floating-separation zone formed at the upper portion therein and an electrolysis zone formed therein below the floating-separation zone;

inlet means to introduce sewage into said tank in the float-separation zone;

means regulating flow of the sewage into the tank comprising a cylinder mounted in the processing tank and said inlet means opening inwardly into the cylinder, said cylinder having a lower portion in the form of a skirt that opens downwardly so as to collect bubbles;

means dividing the floating-separation zone into two portions;

a fixed bed of electrically conductive porous adsorbant particles disposed in the electrolysis zone for adsorbing organic matter, nitrogen compounds and metal ions in the sewage;

a plurality of anode and cathode electrodes disposed among the adsorbent particles;

means supplying electric current to said electrodes thereby polarizing the individual absorbent particles and electrolyzing water to produce hydrogen and oxygen bubbles on the surface of each individual adsorbent particle, the rising flow of the bubbles floating suspended matter and organic matter upward into the floating-separation zone;

means to discharge the suspended matter and organic matter attached to the bubbles out of the processing tank; and

means to take out the sewage so that the sewage will pass from said inlet means to be treated through the floating-separation zone and the electrolysis zone out of the processing tank.

4,294,698

DEVICE FOR CLEANING LIQUID SURFACES

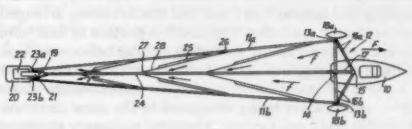
Jean A. L. Bronnec, Brest, France, assignor to Etablissements Generaux de Mecanique de l'Ouest, Brest, France

Filed Nov. 26, 1979, Ser. No. 97,724

Claims priority, application France, Apr. 12, 1981, 78 34077

Int. Cl.³ E02B *15/04*

U.S. Cl. 210—242.3 **16 Claims**



1. A device for cleaning a liquid surface to remove a polluted material therefrom, said device comprising:

(a) a barrier adapted to float on the surface of said liquid, said barrier comprising two diverging wing portions and a tow portion positioned between said wing portions;

(b) inlet means adapted to receive said polluted material prior to passing said polluted material to a recovery apparatus; and

(c) hitching means adapted to maintain each of said wing portions spaced from one another at one of their ends while said barrier is being towed;

each of said wing portions of said barrier comprising only a wing rope adapted to at least partially float on said liquid surface, and wherein said central portion comprises only a flexible tow rope arranged between said wing ropes, said tow rope being adapted to pull said recovery apparatus to thereby exert tension on each of said wing ropes in an amount adapted to maintain each of said wing ropes such that they do not substantially curve in a horizontal plane relative to said surface and to allow for movement of said wing ropes in a vertical plane with respect to said surface.

4,294,699

APPARATUS FOR PURIFYING A LIQUID BY ION-EXCHANGE

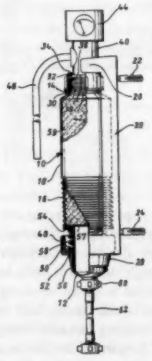
Willy Herrmann, Strombergstrasse 21, 7140 Ludwigsburg, Fed. Rep. of Germany

Continuation of Ser. No. 952,635, Oct. 19, 1978, abandoned. This application Apr. 29, 1980, Ser. No. 144,926

Claims priority, application Fed. Rep. of Germany, May 29, 1978, 2823432

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—287 **4 Claims**



1. Filtering apparatus for treating a liquid such as softening and/or purifying water, comprising an axially elongated hol-

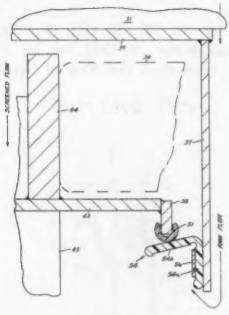
low tubular body, a bed of particulate ion-exchange material confined in said tubular body, at least a portion of the axial length of said tubular body being compressible for varying the volume within said tubular body, said tubular body having an inlet opening and an outlet opening for flowing a liquid through said bed therein, biasing means for applying compressive force for adjusting the volume within said tubular body when said bed of particulate ion-exchange material shrinks, wherein the improvement comprises a supporting bracket for mounting said tubular body and said bracket being arranged to be secured on a wall, the compressible portion of said tubular body comprises an axially extending tubular bellows portion so that the axial length of said tubular body can be decreased as the volume of said bed of particulate ion-exchange material shrinks, said bracket being elongated in the same direction as said tubular body and having an integral stationary abutment at each of the ends thereof spaced apart in the elongated direction, said tubular body being supported between said support abutments with said biasing means securing said tubular body between said support abutments and said tubular body being removably mounted between said abutments, and said biasing means comprising an axially extending compression spring extending in the elongated direction of said tubular body and support bracket and bearing at one end against one of said abutments and at the other end against said tubular body for applying a compressive force against the bed of ion-exchange material within said tubular body and against said tubular body so that as the volume of the bed of ion-exchange material shrinks said spring maintains the compressive force on the bed and deforms the tubular bellows part in the axial direction relative to the shrinkage of the bed, said compression spring being located exteriorly of said tubular body and said tubular body being displaceable in the elongated direction within said bracket against said compressive spring for removing said tubular body from said bracket.

4,294,700

SUBMERGED LARGE DIAMETER SEAL

Thomas J. Casper, Waukesha, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Jun. 8, 1979, Ser. No. 47,191
Int. Cl.³ B01D *33/10*
U.S. Cl. 210—403 **4 Claims**



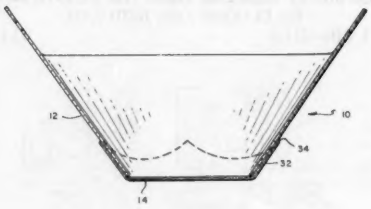
2. A drum screen comprising a rotatable drum having one end provided with a central opening to receive the raw flow, a drum well surrounding the lower part of the drum to receive the screened flow through the drum periphery, one wall of the drum well being provided with an opening which adjoins the opening of said one end of the drum, said one end of the drum having an inwardly extending circular flange, said flange having an end face which is normal to the axis of rotation of the drum, said one wall having a circular rim which is concentric with said flange and extends into the drum through the opening of said one end thereof, and a seal to function between said end of the drum and said wall of the drum well, said seal comprising (1) a seamed tubing of a flexible, low friction material fitted over said flange, said tubing being of one of two forms, one form being a circular element of integral construction, the second form being a linear element with aligned and abutted ends, said tubing being opened at the seam and assembled on said flange with its inner side opposite the seam pressed against the end face of the flange, and (2) a stationary element of a molded wear resistant material and including a flat base which is drawn around the outside of said rim and clamped thereto, said stationary element further including a radially projecting flange which is pivotally movable relative to and pressed by the raw water within the drum against the tubing.

4,294,701

PAINT STRAINER

James P. Whelan, North Marshfield, Mass., assignor to Ad-Tec Products, Inc., Plymouth, Mass.

Filed Jan. 24, 1977, Ser. No. 761,895
Int. Cl.³ B01D *23/28*
U.S. Cl. 210—497.2 **3 Claims**



1. A paint strainer comprising a hollow truncated conical structure having an imperforate side wall of stiff paperboard and open ends, one of which is smaller than the other, a web of flexible screening material stretched taut across the smaller end constituting a perforate bottom for the structure, said screening material being folded upwardly from the bottom onto the outer surface of the side wall and a layer of solvent-resistant adhesive securing the entire surface area of the upwardly-folded portion of the web of flexible screening material to the entire outer surface area of the side wall covered by said upwardly-folded portion of the web of flexible screening material.

4,294,702

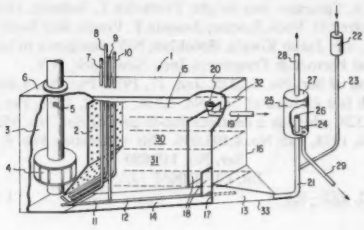
APPARATUS FOR THE CONTROLLABLE REMOVAL OF ONE OR MORE PHASES FROM A LIQUID-LIQUID EXTRACTOR

Lorenz Finsterwalder, Karlsruhe, Fed. Rep. of Germany, assignor to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH, Eggenstein-Leopoldshafen, Fed. Rep. of Germany

Filed Jun. 3, 1977, Ser. No. 803,317
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624936
Int. Cl.³ B01D *11/04*
U.S. Cl. 210—513 **12 Claims**

1. In a liquid-liquid extractor, including a settler for separation of light and heavy liquid phases, an arrangement for controllable removal of one or more liquid phases said arrangement comprising: a tapering member connected to an opening in a wall of the settler for removing a heavy phase from the settler; a first tube having a first end connected to an opening in said tapering member and a second end extending to the level of a light phase; and a second tube and means for intro-

ducing a gas into said second tube, said second tube being connected to said first tube for introducing gas into said first



tube to move liquid present in the first tube in an upwardly direction.

4,294,703

HYDROGEN PEROXIDE TREATMENT OF EFFLUENT

Klaus G. Wilms, Dormagen, and Helmut Waldmann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 165,422

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1979, 2927912

Int. Cl.³ C02F *3/00*

U.S. Cl. 210—631 **6 Claims**

1. In the process for decreasing the COD-content of effluent by treating with hydrogen peroxide in the presence of a transition metal compound, the improvement which comprises adding to the effluent about 5 to 40% of the calculated quantity of H_2O_2 required for the total oxidation of the total COD-content of the effluent, the transition metal compound being dissolved in the effluent in an amount such that the molar ratio of H_2O_2 to transition metal is from about 30:1 to 3:1, bringing the pH initially to about 2 to 9, maintaining the effluent at about 5° to 100° C., separating from the effluent whatever material has flocculated, and after the removal of the flocculated material the effluent is subjected to biological degradation.

4,294,704

PROCESS FOR THE MANUFACTURE OF PRINTING PAPER AND BOARD

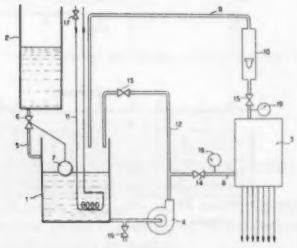
Jean-Claude Daniel, Fontenay-Sous-Bois; Jacques Grossoleil, Pairs, and Robert Roullet, Lyon, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 898,953, Apr. 21, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,239

Claims priority, application France, Apr. 22, 1977, 77 12159

Int. Cl.³ B01D *13/00*; C02F *1/44*

U.S. Cl. 210—651 **5 Claims**



1. Process for the manufacture of printing paper and board having increased wet tear strength and dry tear strength comprising coating the paper or board on one surface with a coating composition containing as a binder an aqueous latex of a synthetic polymer characterized by the fact that the content in the latex of hydrosoluble compounds dissolved in the aqueous phase is less than 0.5% by weight in relation to the polymer, said synthetic polymer being selected from the group consisting of styrene-butadiene copolymers, carboxyl styrene-butadiene copolymers, vinyl polyacetates, carboxyl vinyl polyacetates, alkyl acrylate-vinyl acetate copolymers, and carboxyl alkyl acrylate-vinyl acetate copolymers.

2. Process as claimed in claim 1, in which hydrosoluble compounds are removed from a latex obtained of a synthetic polymer prepared by emulsion polymerization.

4,294,705

METHOD AND AN AGENT FOR CHEMICAL PURIFICATION OF WATER BY MEANS OF CHEMICAL PRECIPITATION AND MAGNETIC SLUDGE SEPARATION

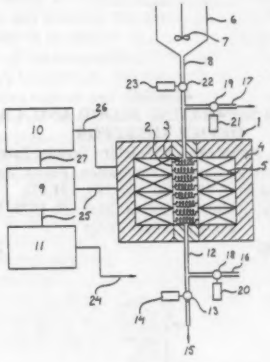
Carl-Johan S. Hellestam, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE78/00063, § 371 Date Jun. 25, 1979, § 102(e) Date May 31, 1979, PCT Pub. No. WO79/00230, PCT Pub. Date May 3, 1979

PCT Filed Oct. 23, 1978, Ser. No. 117,492

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—695 **1 Claim**



1. A method of chemically purifying water with a subsequent magnetic sludge separation comprising introducing into water a solid crystalline precipitant comprising as major components $Al_2(SO_4)_3$ and/or $FeSO_4$ together with a magnetic material, said precipitant consisting of a solid, crystalline composition having a uniform distribution of the magnetic material therein.

4,294,706

PROCESS FOR TREATING WASTE WATER

Naomichi Kakihara; Yoshiaki Harada, and Norio Uedono, all of Osaka, Japan, assignors to Osaka Gas Company, Limited, Osaka, Japan

Filed Apr. 28, 1980, Ser. No. 144,696

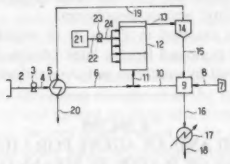
Claims priority, application Japan, May 16, 1979, 54-60886

Int. Cl.³ C02F *1/74*

U.S. Cl. 210—762 **12 Claims**

1. A process for treating ammonia-containing waste water which comprises introducing at a pH of about 8.5 to about 11.5 the waste water to a reactor to subject the same to wet oxidation with an oxygen-containing gas in the presence of a catalyst while maintaining the waste water at a temperature of about 100° to about 370° C. and at pressure permitting the waste water to remain in the liquid phase, the oxygen-containing gas containing oxygen in an amount of about 1 to about 1.5 times

the theoretical amount required for decomposing the ammonia, organic substances and inorganic substances contained in the waste water, the catalyst being supported by at least one of zirconia and titania and comprising at least one of iron, cobalt, nickel, ruthenium, rhodium, palladium, iridium, platinum, copper, gold, tungsten and compounds thereof insoluble or



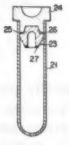
sparingly soluble in water, and supplying an alkali substance to the reactor at a rate required to maintain at least about 80% of the waste water introduced to the reactor and positioned toward the water inlet of the reactor at a pH of at least about 8 at all times and to permit the water resulting from the wet oxidation to retain a pH of about 5 to about 8.

4,294,707

METHOD FOR SEPARATING BLOOD AND A BARRIER DEVICE THEREFOR

Tatsuhiko Ikeda, Kawasaki, and Soichiro Terada, Tama, both of Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Mar. 19, 1980, Ser. No. 131,874
Claims priority, application Japan, Mar. 23, 1979, 54-33943
Int. Cl.³ B01D *21/26*
U.S. Cl. 210—782 **16 Claims**



1. A method for separating blood collected in a blood-collecting tube into a serum part and a solid component part by centrifugation, comprising:

introducing a barrier formed of an elastic foamed plastic member into said blood-collecting tube, said elastic foamed plastic member having a porosity of 97 to 98%, a continuous-pore size of 50 to 400μ, the pores of said elastic foamed plastic member being thermally treated for dissolving a filmy material formed around the pores in the foaming step, an overall true specific gravity greater than that of said serum part, and a frusto-conical upper portion, the upper cross section of which is larger than the cross section of said blood-collecting tube;

moving said elastic foamed plastic member to the interface between a serum part layer and a solid component layer in the blood by centrifugal force produced in centrifuging the blood; and

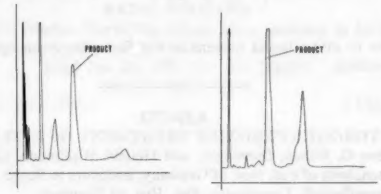
separating serum in the blood.

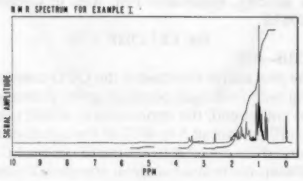
4,294,708

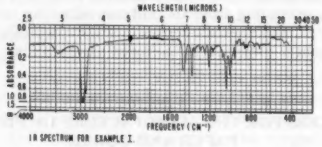
PROCESS FOR AUGMENTING OR ENHANCING THE AROMA OF PERFUMED ARTICLE USING ALKYL CYCLOALKENYL CARBINOL

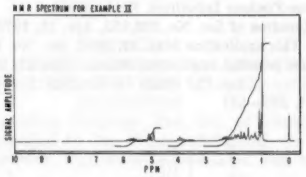
Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

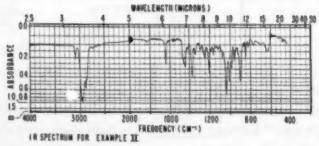
Division of Ser. No. 52,335, Jun. 27, 1979, Pat. No. 4,235,729, which is a division of Ser. No. 8,924, Feb. 2, 1979, Pat. No. 4,197,328, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Feb. 8, 1980, Ser. No. 119,889
Int. Cl.³ D06M *13/16*
U.S. Cl. 252—8.6 **1 Claim**





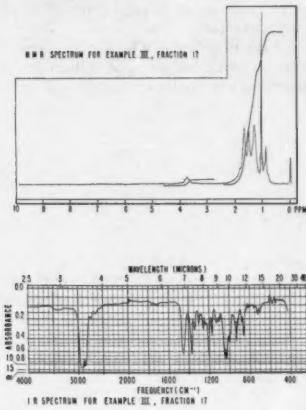




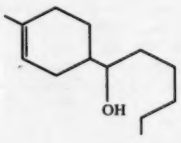


1. A process for augmenting or enhancing the aroma of a perfumed article selected from the group consisting of fabric

softener compositions, fabric softener articles and optical brightener compositions comprising the step of intimately


N M R SPECTRUM FOR EXAMPLE III, FRACTION I7
WAVELENGTH (MICRONS)
ABSORBANCE
FREQUENCY (CM⁻¹)
I R SPECTRUM FOR EXAMPLE III, FRACTION I7

admixing with a fabric softener article coating, or a fabric softener composition, or an optical brightener composition, from 0.01% up to 0.5% of a compound having the structure:



4,294,709

SPIN FINISH WITH ANTI-STATIC AGENT

Norman Anderson, Matthews, N.C.; Richard Peak, and James A. Moyse, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 10, 1980, Ser. No. 110,994

Claims priority, application United Kingdom, Jan. 26, 1979, 02933/79; Jun. 4, 1979, 19385/79

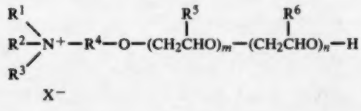
Int. Cl.³ D06M *15/42, 13/46, 15/00*

U.S. Cl. 252—8.8 **4 Claims**

1. A spin finish composition comprising

(1) a lubricant selected from the group consisting of mineral oils, esters and copolymers of ethylene oxide, propylene oxide and mixtures thereof for spin finishes, and

(2) an antistatic agent of the formula



where:

R^1 and R^2, which may be same or different, are alkyl groups containing up to six carbon atoms;

R^3 is an alkyl group containing up to twelve carbon atoms;

R^4 is an alkylene group containing up to ten carbon atoms;

R^5 and R^6 are hydrogen or methyl;

m and n are integers from 0 to 60, provided that either m or n is at least 1 and where R^5 and R^6 are different, the poly alkylene oxide units are in block or random copolymer relationship and further provided that at least one propylene oxide unit is always present; and

X is an anion.

4,294,710

DETERGENT SOFTENER WITH AMINE INGREDIENT

Frederick E. Hardy, Gosforth, and Colin A. Dewar, Tweedmouth, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 30, 1980, Ser. No. 164,446

Claims priority, application United Kingdom, Jul. 5, 1979, 23527/79

Int. Cl.³ D06M *11/04, 13/36, 13/46*

U.S. Cl. 252—8.8 **6 Claims**

1. A method of preparing a detergent composition adapted to provide fabric softening benefits when used to wash textiles, said method constituting the steps of

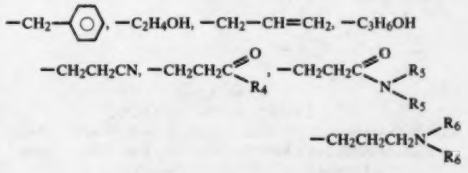
(a) forming a slurry containing (i) an anionic surfactant selected from the group consisting of sodium and potassium C_9–C_{15} alkyl benzene sulphonates, C_{12}–C_{18} alkyl sulphates and C_{12}–C_{18} alkyl polyethoxy ether sulphates containing from about 1 to about 12 ethoxy groups per mole and mixtures thereof, said anionic surfactant being present in an amount to provide from about 3% to about 30% of the composition, (ii) a water soluble alkaline detergency builder salt selected from the group consisting of alkaline sodium and potassium carbonates, borates, phosphates, polyphosphates, silicates, polycarboxylates, polyphosphonates, amino polycarboxylates, amino polymethylene phosphonates and mixtures thereof, said detergency builder salt being present in an amount to provide from about 10% to about 80% of the composition,

(b) spray during said slurry so as to form free-flowing spray dried granules and

(c) spraying said spray dried granules with a tertiary amine in liquid form in an amount of from about 1% to about 25% by weight of the composition, said amine being selected from the group consisting of

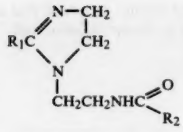
(i) alkylamines of formula

wherein R_1 and R_2 are each radicals independently selected from C_{10}–C_{26} alkyl and alkenyl groups and R_3 represents a radical selected from the group consisting of



wherein R_4 is a C_1–C_4 alkyl group, each R_5 is independently selected from H and C_1–C_4 alkyl groups and each R_6 is independently selected from H and C_1–C_{20} alkyl groups and

(ii) imidazoline derivatives of formula



wherein R_1 and R_2 are as defined above and (iii) mixtures of any of (i) and (ii).

(d) dry mixing oxygen bleaching agent or enzyme or silica/silicone suds suppressor or mixtures thereof with the product of step (c).

4,294,711

WASHING AND SOFTENING COMPOSITIONS AND METHODS FOR THEIR MANUFACTURE

Frederick E. Hardy, Gosforth, and Barry Stoddart, Gateshead, both of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 15, 1980, Ser. No. 187,371

Claims priority, application United Kingdom, Sep. 21, 1979, 32918/79

Int. Cl.[3] **C11D** *3/42, 11/00, 11/02;* **D06M** *13/44*

U.S. Cl. 252—8.75 **9 Claims**

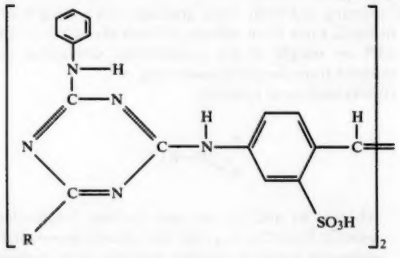
1. A granular detergent composition adapted to impart a soft feel to fabrics washed therewith, consisting essentially of:

(a) from about 3% to about 30% by weight of a polyethoxy nonionic detergent having a hydrophilic-lipophilic balance in the range from about 8 to about 15 and having not more than an average of 16 ethoxy units per molecule;

(b) from about 1% to about 15% by weight of a cationic surfactant material;

(c) from about 10% to about 80% by weight of a detergency builder; and

(d) from about 0.001% to about 3% by weight of an acid optical brightener of the following structure



wherein R is selected from the group consisting of methylamino- and morpholino- groups.

4,294,712

SELF-LUBRICATING BEARING

Toshihiko Ueno, and Teruhisa Tomogane, both of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Kobe, Japan

Filed Aug. 21, 1980, Ser. No. 180,166

Claims priority, application Japan, Aug. 29, 1979, 54-110944; Sep. 26, 1979, 54-124401; Mar. 17, 1980, 55-34339; Mar. 17, 1980, 55-34340; Mar. 17, 1980, 55-34341

Int. Cl.[3] **C10M** *5/10, 5/02, 7/14, 7/04*

U.S. Cl. 252—12 **11 Claims**

1. A self-lubricating bearing comprising 1 to 40 volume percent lubricating oil; 0.1 to 20 volume percent carrier for said lubricating oil, said carrier being selected from the group consisting of polynorbornene resin, expanded graphite and mixtures thereof; and remainder main bearing material comprising another synthetic resin having properties of slidability and abrasion resistance.

11. The bearing of claim **1**, wherein said synthetic resin is selected from the group consisting of polyamides, polyacetals, polybutylenephthalates, polycarbonates, and polytetrafluroethylenes.

4,294,713

GREASE COMPOSITIONS CONTAINING SELECTED SHIELDED POLYSILICATE COMPOUNDS

Karl O. Knollmueller, Hamden; Robert J. Fairbrother, and David F. Gavin, both of Cheshire, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 31, 1980, Ser. No. 135,744

Int. Cl.[3] **C10M** *5/26, 7/48, 7/50*

U.S. Cl. 252—28 **28 Claims**

1. A grease composition comprising:

(a) a major amount of a shielded polysilicate compound selected from the group consisting of alkoxysilane cluster compounds, alkoxysilanol cluster compounds, alkoxysilane ester compounds, alkoxysilane multiple cluster compounds, silicone-bridged alkoxysilane double cluster compounds, distillation residues containing these compounds, and mixtures thereof; and

(b) an amount of at least one grease thickener sufficient to thicken said shielded polysilicate compound to a grease consistency.

4,294,714

CARBOXYLIC ACID SALT CONTAINING DEPOSIT CONTROL ADDITIVES AND FUEL AND LUBE OIL COMPOSITIONS CONTAINING THEM

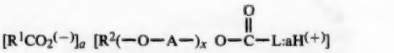
Robert A. Lewis, Berkeley, and Lewis R. Honnen, Petaluma, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jul. 25, 1979, Ser. No. 60,306

Int. Cl.[3] **C10M** *1/32, 3/26;* **C10L** *1/22*

U.S. Cl. 252—34 **13 Claims**

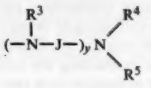
2. An additive composition effective as a minor component in a fuel or lubricating oil composition for reducing the deposition of solids in the intake system and crankcase of an internal combustion engine, said additive composition comprising at least one salt of the formula



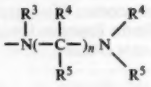
wherein:

(1) R^1 is a hydrocarbyl group having a carbon atom content in the range 3 to 30 selected from the group consisting of alkyl, phenyl, cyclohexyl, alkenyl, cyclohexenyl, combinations thereof and of said groups having a single hydrogen atom thereof substituted by a hydroxyl or alkoxyl group, provided that said substituent is attached to a carbon atom at least 4 carbon atoms distant from the carboxyl group of said anion;

(2) R^2 is a hydrocarbyl group having a carbon atom content in the range from 1 to 30 selected from the group consisting of phenyl, mono-, di- and trialkylphenyl, alkyl, alkenyl, cyclohexyl, cyclohexenyl and combinations thereof;
(3) A is an alkylene group having a carbon atom content in the range of from 2 to 4 and x is an integer sufficient to provide said cation in unprotonated form with a molecular weight in the range of from about 500 to 10,000;
(4) L is monovalent and selected from the group consisting of radicals of the formula


(i)

wherein J is an alkylene group having a carbon atom content in the range 2 to 6 and y is an integer in the range 1 to 11,


(ii)

wherein n is an integer in the range 2–6, and
(iii) $NHCH_2C(OH)HCH_2NH_2$;
(5) R^3, R^4 and R^5 are the same or different groups having a carbon atom content in the range 0 to 16 selected from the group consisting of hydrogen, hydrocarbyl, acyl, alkoxy, ketoalkyl, hydroxyalkyl and cyanoalkyl groups; and
(6) a is an integer in the range 1 to 3.

4,294,715

IMPREGNATING AGENT AND ITS USE

Alfons Klein, Duesseldorf; Rudolf Kron, Leverkusen; Karlfried Wedemeyer, Cologne; Ernst Knust, and Lothar Havenith, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 11, 1979, Ser. No. 83,876

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1979, 2926609

Int. Cl.³ H01B *3/18, 3/40*

U.S. Cl. 361—318 **5 Claims**

1. A dielectric composition comprising a mixture of isopropylated diphenyls, said mixture containing 30 to 60 parts by weight of mono-isopropylated diphenyls and 70 to 40 parts by weight of poly-isopropylated diphenyls, said poly-isopropylated diphenyls comprising di-, tri- and tetra-isopropylated diphenyls, said poly-isopropylated diphenyls comprising 60 to 85 parts by weight of di-isopropylated diphenyls, 10 to 35 parts by weight of tri-isopropylated diphenyls and 0.5 to 5 parts by weight of tetra-isopropylated diphenyls, the amount of di, tri- and tetra-isopropylated diphenyls being based upon the total amount of poly-isopropylated diphenyls said mixture containing an epoxide and a hydroquinone derivative.

4,294,716

HALOCARBON AND AZEOTROPE REFRIGERANT COMPOSITIONS CONTAINING OFFENSIVE WARNING COMPONENT

Joseph F. Saccavino, W. Branch Rd., Mahopac, N.Y. 10541, and Edward A. Vanek, 964 Cedarhurst St., North Woodmere, N.Y. 11581

Filed May 14, 1980, Ser. No. 149,163

Int. Cl.³ C09K *5/00;* **C10M** *01/30*

U.S. Cl. 252—68 **1 Claim**

1. A refrigerant composition comprising:
a substantially odorless chlorofluorocarbon;
an odorant component, said component being not more than 2% by weight of the composition, said component being inert, volatile and soluble in said chlorofluorocarbon, said component being an organic ketone selected from the group consisting of 3-Methyl-Cyclohexanone and Methyl Isobutyl Ketone, said refrigerant composition adapted for use in a refrigeration system whereby any leaks which develop in said system can be readily detected due to the noticeable and pervasive odor resulting from the vaporation of said odorant component such that said leak may be rapidly repaired preventing continued operation of said refrigeration system at reduced efficiency.

4,294,717

COMPOSITIONS CONTAINING AN ALKALI METAL MONO- OR POLYALKYLARYLSULFONATE AND THE CORRESPONDING HYDROPEROXIDE, PROCESS FOR THEIR PREPARATION AND DETERGENT COMPOSITIONS CONTAINING THEM

Pierre Couderc; Jean-Luc Grardel, both of Bethune, and Gerard Caux, Bully les Mines, all of France, assignors to Societe Chimique des Charbonnages SA, Paris, France

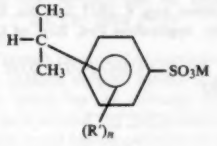
Filed Apr. 16, 1979, Ser. No. 30,666

Claims priority, application France, Apr. 14, 1978, 78 11082; Oct. 10, 1978, 78 28907

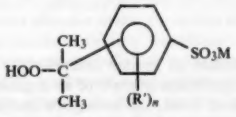
Int. Cl.³ C11D *7/54, 7/56, 9/42*

U.S. Cl. 252—97 **36 Claims**

11. A dry detergent composition containing up to 30% of a solid, dry bleaching agent comprising (a) at least one alkali metal alkylarylsulfonate having the formula:



wherein
M is an alkali metal;
R′ is lower alkyl; and
n is 0, 1, 2, 3, or 4; and
(b) the hydroperoxide obtained by hydroperoxidation of said at least one alkali metal alkylarylsulfonate and having the formula



wherein M, R′ and n are as defined above;
wherein the amount of said hydroperoxide contained in said detergent composition is from 0.1 to 21% by weight of said detergent composition.

14. The detergent composition of claim 11, further comprising at least one anionic detergent, at least one soap, at least one non ionic detergent, sodium tripolyphosphate, sodium silicate and at least one of sodium sulfate or sodium carbonate.

4,294,718

NON-GELLING INORGANIC SALT CRUTCHER SLURRIES

James A. Kaeser, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 10, 1980, Ser. No. 128,574
Int. Cl.[3] C11D 3/04, 7/14
U.S. Cl. 252—135 22 Claims

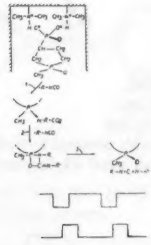
1. A method of retarding or preventing the gelation of a miscible and pumpable crutcher slurry containing from about 40 to 70% of solids and 60 to 30% of water, of which solids content, on a 100% solids basis, about 55 to 85% is sodium bicarbonate, about 5 to 25% is sodium carbonate, and about 5 to 25% is sodium silicate of $Na_2O:SiO_2$ ratio within the range of 1:1.4 to 1:3, with the ratio of sodium bicarbonate:sodium carbonate being within the range of about 2:1 to 8:1, the ratio of sodium carbonate:sodium silicate being within the range of about 1:3 to 3:1, and the ratio of sodium bicarbonate:sodium silicate being within the range of about 2:1 to 10:1, which comprises preparing a crutcher slurry of the described composition containing from 0.1 to 2% of a citric material selected from the group consisting of citric acid, water soluble citrate and mixtures thereof, and from 0.1 to 1.4% of magnesium sulfate, with the total of such citric material and magnesium sulfate, in combination, being gelation retarding and at least 0.4% of the slurry, and mixing such composition in the crutcher during preparation thereof.

4,294,719

POLYISOCYANATES WHICH CONTAIN CARBODIIMIDE GROUPS AND WHICH ARE STABLE IN STORAGE

Kuno Wagner, Leverkusen; Hans-Dieter Block, and Walter Schäfer, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 653,689, Jan. 30, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,489
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1975, 2504400
Int. Cl.[3] C08G 18/18, 73/10
U.S. Cl. 252—182 19 Claims



1. A composition of matter comprising a storage-stable, catalyst-free, equilibrium mixture of an organic carbodiimide, an organic uretone imine, and an organic isocyanate produced by the process comprising:

(a) contacting an organic mono- and/or polyisocyanate, optionally dissolved in an inert solvent, with a high molecular weight, insoluble catalyst, said catalyst comprising a high molecular weight, insoluble inorganic or organic matrix and a low molecular weight carbodiimidization catalyst linked to said matrix via ionic bonds, and

(b) removing said insoluble catalyst when the desired degree of carbodiimidization has been reached.

4,294,720

PROCESS FOR THE PREPARATION OF GAS MIXTURES

Pieter Visser, Amsterdam, and Johan P. van de Water, The Hague, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 7, 1979, Ser. No. 101,340
Claims priority, application Netherlands, Dec. 22, 1978, 7812466
Int. Cl.[3] C01B 2/06
U.S. Cl. 252—373 5 Claims

1. A process for preparing a gas mixture containing hydrogen and carbon monoxide comprising partially oxidizing a hydrocarbon feedstock with oxygen or an oxygen-containing gas in a partial oxidation reactor at elevated pressure to produce a raw product gas, contacting the raw product gas in a quench zone with water to remove soot and other contaminating material from the gas and producing a gas mixture and a soot-containing liquor, removing soot-containing liquor from the quench zone, and contacting the liquor removed with oxygen or an oxygen-containing gas in a soot oxidation reactor at a temperature between 240° C. and 375° C., and at a pressure at least equal to the vapor pressure of water at the temperature used to oxidize the soot in the liquor and producing CO_2 and a substantially soot-free water effluent.

4,294,721

PROCESS FOR PREPARING COMPONENTS OF CATALYSTS FOR POLYMERIZING ALPHA-OLEFINS AND MIXTURES THEREOF WITH ETHYLENE

Giuliano Cecchin, Ferrara, and Enrico Albizzati, Arona, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 921,717, Jul. 3, 1978, abandoned. This application Mar. 28, 1980, Ser. No. 134,773
Claims priority, application Italy, Jul. 4, 1977, 25345 A/77
Int. Cl.[3] C08F 4/64
U.S. Cl. 252—429 B 7 Claims

1. Process for preparing solid catalyst components for the polymerization of alpha-olefins and mixtures thereof with ethylene, which comprises reacting a Ti compound containing at least one Ti-halogen linkage with at least one of the following substances:

(1) a hydrocarbyl electron-donor compound ED which does not contain active hydrogen atoms and an adduct (a) of a Mg dihalide with at least one hydrocarbyl electron-donor compound AH containing active hydrogen atoms and present in the adduct in an amount of at least 0.5 moles/mole of Mg dihalide, electron-donor compound ED being reacted in an amount of not less than 0.05 moles/mole of compound AH of the adduct;

(2) an adduct (b) of at least a Mg dihalide with a compound AH and ED, as defined in (1), compound ED being present in an amount ranging from 0.05 to 1 mole/mole of compound AH, and adducts (a) and (b) being prepared without co-grinding of the Mg dihalide with compounds AH and ED; the amount of compound ED that remains in the solid after extraction thereof with $TiCl_4$ at 80° C. for 2 hours being comprised between 0.3 and 3 moles/gram atom of Ti, and the amount of Ti compounds extractable with $TiCl_4$ at 80° C. being lower than 50%.

4,294,722

PREPARATION OF VANADIUM PHOSPHORUS CATALYSTS

Noel J. Bremer, Kent, and Dennis E. Dria, Spencer, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 106,786, Dec. 26, 1979, Pat. No. 4,244,879. This application May 19, 1980, Ser. No. 150,783
Int. Cl.[3] B01J 27/14
U.S. Cl. 252—435 18 Claims

1. A process for the preparation of oxidation catalysts containing the mixed oxides of vanadium and phosphorus which comprises

(a) introducing a pentavalent vanadium-compound into an organic liquid capable of at least partially solubilizing and capable of reducing vanadium to a valence state less than +5 to form a reaction medium in which at least a portion of said vanadium compound remains unsolubilized;
(b) effecting reduction of at least a portion of said vanadium to a valence state of +4;
(c) removing unsolubilized vanadium-containing compounds having a particle size greater than about 0.1 mm diameter;
(d) adding a pentavalent phosphorus-containing compound to the reaction medium resulting from step (c) to form a catalytst precursor precipitate;
(e) recovering said catalyst precursor precipitate;
(f) drying said catalyst precursor precipitate;
(g) calcining said precipitate to form the active oxidation catalyst.

4,294,723

HEAT RESISTANT CATALYST FOR THE PRODUCTION OF SULFURIC ACID FOR USING A GAS CONTAINING SULFUR DIOXIDE IN A HIGH CONCENTRATION

Haruichi Hara, Toyonaka; Toshihide Kanzaki, Takatsuki; Hisanao Motomuro, and Akiyoshi Adachi, both of Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaki, Japan

Continuation of Ser. No. 689,807, May 25, 1976, abandoned. This application Sep. 27, 1977, Ser. No. 837,226
Claims priority, application Japan, May 29, 1975, 50-63492
Int. Cl.³ B01J *27/02*
U.S. Cl. 252—440 **5 Claims**

1. A heat resistant catalyst suitable for the production of sulfuric acid by using a gas containing sulfur dioxide in a high concentration at a reaction temperature of 420° to 800° C. which consists essentially of vanadium pentoxide as the main catalytic component, potassium sulfate as a promoter and a carrier consisting essentially of diatomaceous earth wherein the ratio of K_2O(mol)/V_2O_5(mol) is 4 to 5, V_2O_5 content is 5.5 to 7% by weight and the sum of the value of said ratio and the V_2O_5 content (% by weight) is 9.5 to 11.

4,294,724

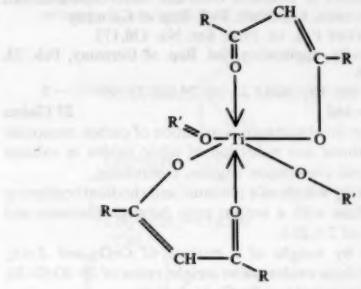
TITANIUM IMPREGNATED SILICA-CHROMIUM CATALYSTS

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 6, 1980, Ser. No. 118,893
Int. Cl.³ B01J *21/08, 23/26, 21/00*
U.S. Cl. 252—451 **28 Claims**

1. A process for producing a chromium-containing catalyst comprising forming a silica hydrogel containing a pore preserving agent selected from (1) organic silicon compounds having the structure R_nSiA_{4-n} wherein n is an integer of 2 or 3, and wherein each R is a saturated or unsaturated hydrocarbon group wherein each R can be the same or different and wherein A is selected from the group consisting of hydroxy radicals, halides and alkoxy radicals in which the alkyl group therein contains from 1 to about 10 carbon atoms, (2) water soluble inorganic acids which are sufficiently ionized to produce a pH of 0 to 3.5, (3) organic acids having an acid strength equal to or greater than that of acetic acid, and (4) anionic, cationic or non-ionic surfactants; drying said hydrogel by means of air oven drying, spray drying, tray drying, vacuum oven drying or drying under a heat lamp to form a xerogel; and anhydrously incorporating a titanium compound into said xerogel, and wherein said chromium is introduced by either coprecipitating same with said silica hydrogel, by combining an aqueous solution of a water-soluble chromium compound with said hydrogel, or adding anhydrous solution of a chromium compound soluble in non-aqueous solvents to said xerogel.

17. A process for producing a chromium-containing catalyst comprising forming a silica hydrogel and thereafter removing water to form a xerogel, said silica in either the hydrogel stage or the xerogel stage being impregnated with an aqueous titanium-containing composition formed by mixing an essentially water-free organic acid and a titanium compound of the formula



wherein the R and R′ groups are the same or different and are selected from 1–7 carbon atom alkyl radicals to give a titanium-containing composition and thereafter diluting said titanium-containing composition with water to give said aqueous titanium-containing composition, and wherein said chromium is introduced by either coprecipitating same with said silica hydrogel, by combining an aqueous solution of a water-soluble chromium compound with said hydrogel, or adding an anhydrous solution of a chromium compound soluble in a non-aqueous solvent to said xerogel.

4,294,725

CATALYST, METHOD FOR CATALYST MANUFACTURE AND USE

Dan Fraenkel, and Bruce C. Gates, both of Newark, Del., assignors to University of Delaware, Newark, Del.

Filed Nov. 20, 1979, Ser. No. 95,989
Int. Cl.³ B01J *29/14*
U.S. Cl. 252—455 Z **3 Claims**

1. A Fischer-Tropsch type catalyst comprising a particulate synthetic zeolite catalyst support having a pore size in the range of 2–10 A, which has ion exchange properties, within which there is incorporated, by ion exchange, at least one reducible transition metal having catalytic properties effective in the conversion of CO and H_2 to hydrocarbon products consisting essentially of cobalt, said transition metal being reduced by the vapor of at least one preselected reductant metal consisting essentially of cadmium having a reduction potential greater than the reduction potential of said transition metal at a temperature below about 800° C.

2. The method of preparing a Fischer-Tropsch catalyst comprising in sequence: (a) contacting a particulate synthetic zeolite catalyst support having a pore size in the range of 2–10 A with a solution of a salt of a reducible transition metal having catalytic properties effective in the conversion of CO and H_2 to hydrocarbon products consisting essentially of cobalt; (b) drying to eliminate substantially all water from the zeolite pores; (c) reducing a substantial proportion of the transition metal within the dried reducible transition metal solution-treated zeolite prepared per step (b) by exposure to the vapor of a reductant metal consisting essentially of cadmium, having a reduction potential greater than the reduction potential of said transition metal at a temperature below about 800° C.; (d) heating the product of step (c) to remove superfluous reductant metal from said product of step (c); and (e) cooling under vacuum or in an inert atmosphere to a temperature below about 200° C.

4,294,726

CATALYST FOR THE PURIFICATION OF EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Alfred Bozon, Erlensee; Edgar Koberstein, Alzenau; Hans-Dieter Pletka, Freigericht; Herbert Völker, Hanau, and Eduard Lakatos, Rheinfelden-Eichsel, all of Fed. Rep. of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Feb. 11, 1980, Ser. No. 120,172

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907106

Int. Cl.[3] B01J *21/06, 23/10, 23/89*

U.S. Cl. 252—462 27 Claims

1. A catalyst for simultaneous oxidation of carbon monoxide and hydrocarbons and reduction of nitric oxides in exhaust gases of internal combustion engines, comprising

(a) 0.03–3% by weight of a platinum and rhodium containing active phase with a weight ratio between platinum and rhodium of 2:1-20:1;

(b) 5–15% by weight of a mixture of CeO_2 and ZrO_2, whereby these oxides are at weight ratios of 20–80:80–20;

(c) 1–10% by weight of Fe_2O_3 as well as

(d) a residual quantity up to 100% by weight of aluminum oxide of the transition series

and obtained by impregnating a carrier material of Al_2O_3 of the transition series, with an aqueous solution containing cerium, zirconium and iron salts or, mixing the carrier material with the respective oxides of cerium, zirconium and iron, tempering for 30–180 minutes in air at 500°–700° C. thereupon impregnating the carrier with an aqueous solution of a salt of platinum and a salt of rhodium, drying and subsequently treating in a gas current containing hydrogen at temperatures 250°–650° C.

4,294,727

PERFUME COMPOSITION CONTAINING 4,5-DIOXA-5-ALKYL-TRICYCLO[7.2.1.0 2,8]DODEC-10-ENES AND ITS USE AS AN ODORANT

Jens Conrad, Hilden; Horst Upadek, Erkrath, and Klaus Bruns, Krefeld-Traar, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

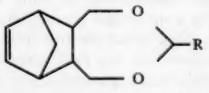
Filed Apr. 21, 1980, Ser. No. 142,607

Claims priority, application Fed. Rep. of Germany, May 5, 1979, 2918168

Int. Cl.[3] C11B *9/00*

U.S. Cl. 252—522 R 5 Claims

1. A perfumery composition comprising from about 1 to 50 percent by weight of at least one tricyclododecene of the formula:



wherein R is a member selected from the group consisting of alkyl having from 1 to 8 carbon atoms, alkenyl having from 2 to 8 carbon atoms and alkynyl having from 2 to 8 carbon atoms, and the remainder customary constituents of perfumery compositions.

4,294,728

SHAMPOO AND/OR BUBBLE BATH COMPOSITION CONTAINING SURFACTANT AND 1,2 ALKANE DIOL

Guy Vanlerberghe, Montjay-La-Tour; Henri Sebag, Paris, and Claire Fiquet, Paris, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation of Ser. No. 565,130, Apr. 4, 1975, abandoned, which is a continuation of Ser. No. 227,299, Feb. 17, 1972, abandoned. This application Nov. 26, 1979, Ser. No. 97,492

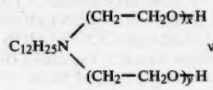
Claims priority, application Luxembourg, Feb. 17, 1971, 62616; Feb. 17, 1971, 62617

Int. Cl.[3] C11D *1/835;* A61K *7/06*

U.S. Cl. 252—542 8 Claims

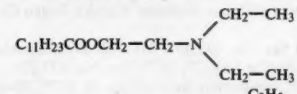
1. A shampoo composition consisting essentially of an aqueous solution of

(a) 0.5–30 percent by weight based on the total weight of the composition of a surfactant selected from the group consisting of



(1)

wherein x + y = 15,



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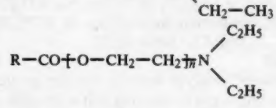
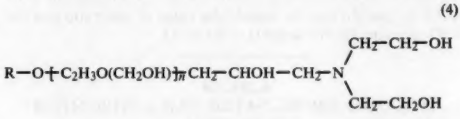


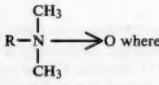
(3)

wherein R is the hydrocarbon chain from the fatty acids of copra and n=2.5,



(4)

wherein R is the hydrocarbon radical of oleic acid and n=1,



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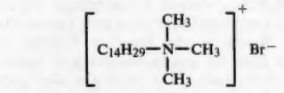

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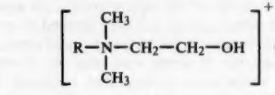
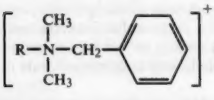


(7)

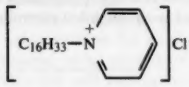
wherein R is the alkyl from the fatty acids of tallow,



(8)

wherein R is a mixture of dodecyl to hexadecyl,

(9)



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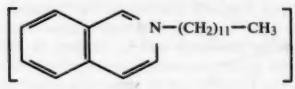

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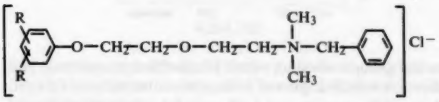
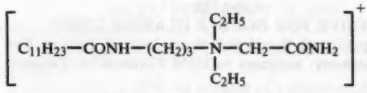


wherein R is isobutyl,

(12)



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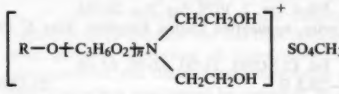
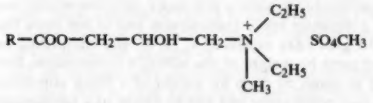


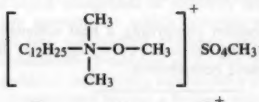
wherein R is a mixture of doecyl and tetradecyl, and n=1.5,

(14)



wherein R is the alkyl from the fatty acids of copra,

(15)



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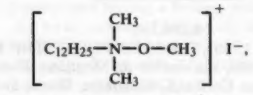

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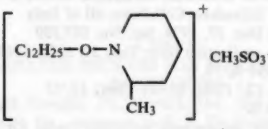

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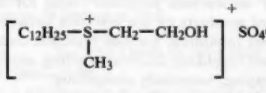

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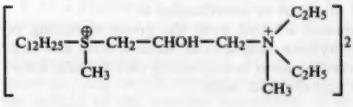

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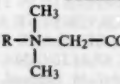
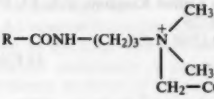


wherein R is a mixture of dodecyl and tetradecyl,

(21)



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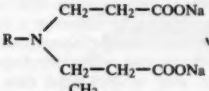

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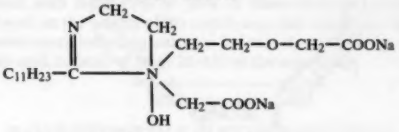

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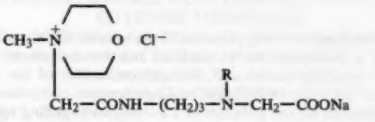
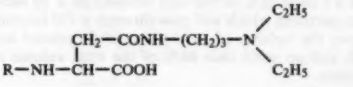


wherein R is the alkyl of the fatty acids of copra and

(25)



wherein R is the hydrocarbon chain from the fatty acids of copra and mixtures thereof; and

(b) 0.4 to 4.5 percent by weight based on the total weight of the composition of a straight chain 1,2-alkane diol selected from the group consisting of 1,2-alkane diols having 10–14 carbon atoms, and mixtures thereof.

4,294,729

COMPOSITION CONTAINING ALCOHOL AND USE THEREOF FOR EPOXY REMOVAL

Peter Bakos, Endicott; Russell E. Darrow, Newark Valley; Joseph Funari, Vestal, and Richard M. Poliak, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,623

Int. Cl.³ C09D *9/00, 9/04;* **C11D** *3/43, 3/44*

U.S. Cl. 252—545 **42 Claims**

1. A removal composition capable of removing a cured epoxy polymer from a substrate consisting essentially of at least about 75% by weight based upon the weight of the composition of an organic cyclohydrocarbyl alcohol boiling above about 110° C., wherein said hydrocarbyl is selected from the group of aromatic ring, cycloaliphatic ring or terpene ring, and a minor amount of an ionic fluorocarbon surface agent.

11. The composition of claim **1** wherein the surface-active agent is present in an amount of at least about 0.05% by weight of the composition.

4,294,730

GELLED LUBRICANT COMPOSITION FOR RUN-FLAT TIRES COMPRISING POLYBUTENE ACRYLIC OR POLYOLEFIN GELLING AGENT AND PARTICULATE SOLID PUNCTURE SEALING MATERIAL

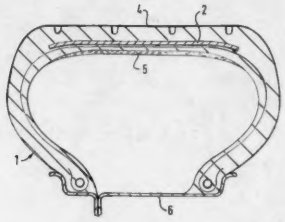
Michael J. Kenney, Sutton Coldfield, England, assignor to Dunlop Limited, England

Division of Ser. No. 766,679, Feb. 8, 1977. This application Oct. 2, 1979, Ser. No. 81,158

Claims priority, application United Kingdom, Feb. 13, 1976, 5674/76; Oct. 15, 1976, 42864/76

Int. Cl.³ C08L *1/02*

U.S. Cl. 260—17.4 BB **14 Claims**



1. A composition for application to the interior surface of the tread of a pneumatic tire to facilitate relative movement between contacting portions of the interior surface of the tire when the tire is driven deflated, said composition comprising a polybutene, an acrylic polymer or a polyolefin as gelling agent for the polybutene, and a particulate solid puncture sealing material, the particles of said puncture sealing material being of sizes distributed in a range extending from particles passing through a 7 mesh B.S. screen and retained on a 10 mesh B.S. screen to particles which will pass through a 150 micron aperture sieve, the volume of particulate solid material being at least 8% and no more than 66% of the total volume of said composition.

4,294,731

METHOD FOR DRYING ABSORBENT MODIFIED CELLULOSIC POLYMERS AND THE LIKE

Thomas C. Allen, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 39,725, May 17, 1979, abandoned. This application Aug. 13, 1980, Ser. No. 177,678

Int. Cl.³ C08L *1/00*

U.S. Cl. 260—17.4 CL **18 Claims**

1. A method for drying chemically modified cellulose or starch materials which comprises mixing the materials with an aqueous solution of at least one amphiphilic compound, which is miscible with water nonvolatile and substantially non-reactive with said modified cellulose and thereafter evaporating the water from the materials at an elevated temperature whereby said amphiphilic compound is retained by said materials and prevents the substantial collapse of the cellulosic structure, thereby avoiding significant reduction in water absorbency or loss of aesthetics of the material.

4,294,732

RUBBER MOUNTING COMPOSITIONS

Tomio Ohyachi, Akigawa, and Koichi Irako, Higashimurayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

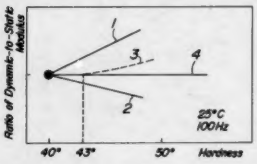
Filed Aug. 14, 1980, Ser. No. 177,962

Claims priority, application Japan, Aug. 16, 1979, 54/103535; Feb. 15, 1980, 55/16541

Int. Cl.³ C08L *93/04*; F16M *13/00*

U.S. Cl. 260—27 BB **6 Claims**

1. Rubber mounting compositions having excellent vibration isolating properties at a relatively high hardness obtained by compounding 100 parts by weight of at least one of natural rubber, diene rubbers and diene copolymeric rubbers or a rubber blend of these rubbers and a halogenated butyl rubber, 0.5–35 parts by weight of an oil modified phenol resin selected



from the group consisting of tall oil modified phenol resin and cashew oil modified phenol resin, a modified ratio of said tall oil being 30% or more, and 2–30 parts by weight based on said resin, of a hardening agent for the phenol resin and hardening the resulting mixture.

4,294,733

ADHESIVE FOR DOUBLE GLAZING UNITS

Taieb Marzouki, and Bernd Schwisser, both of Taunus, Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Apr. 2, 1979, Ser. No. 26,064

Claims priority, application United Kingdom, May 5, 1978, 13236/78

Int. Cl.³ C08L *53/00, 63/00, 91/06*

U.S. Cl. 260—28.5 B **26 Claims**

1. A sealant system comprising an adhesive composition and a primer composition which on combination provide a cured adhesive;

said adhesive composition being a composition which is extrudable as a hot melt from about 140° C. to about 190° C. and is hardenable to yield a non-tacky, cohesive elastic mass having a moisture vapor transmission rate of not more than about 0.5 g/m^2/day measured at 38° C. and comprising per hundred parts by weight of the adhesive composition, from about 5 to about 50 parts by weight of a block copolymer having two polystyrene end blocks linked to a substantially saturated polyolefin rubber midblock, from about 5 to about 50 parts by weight of an aliphatic hydrocarbon resin having a melting point not less than 60° C., from about 2 to about 40 parts by weight of a curable epoxy resin and a finely divided inorganic filler;

said primer composition comprising a heat softenable polymeric composition and an amine curing agent for the epoxy resin in the adhesive composition.

4,294,734

LOW VISCOSITY UNSATURATED POLYESTER RESINS

Giovanni Corrado, 190, Via Gentile da Mogliano, Roma; Elvio Bertotti, 45, Corso Garibaldi, Colleferro, Roma, and Bruno Sopino, 21, Via Belvedere, Colleferro, all of Italy

Filed Dec. 27, 1979, Ser. No. 107,709

Claims priority, application Italy, Dec. 29, 1978, 31405 A/78; Jun. 29, 1979, 23991 A/79

Int. Cl.³ C08L *91/00*; C08G *63/52*

U.S. Cl. 260—22 CB **5 Claims**

1. Low viscosity unsaturated polyester resins for making glass fiber reinforced products by the injection between coupled moulds, vacuum moulding, vacuum injection moulding, low pressure pressure moulding, filament winding, application by hand and by spraying, essentially comprising:

(A) an alkyd prepared by esterification of

(a) a compound selected from the group consisting of maleic anhydride, maleic acid, fumaric acid, and mixtures thereof alone or in association with phthalic anhydride or phthalic acid, with

(b) one or more glycols essentially comprising dipropylene glycol, and at least

(B) one ethylenically unsaturated monomer copolymerizable with (A), selected from the group consisting of styrene and vinyltoluene, in an amount of 27–34% by weight of the total (A)+(B), said unsaturated polyester resins being characterized by the fact that said alkyd (A) has a molecualr weight/double bond factor between 200 and 360 and has an amount of free functional groups constituted by hydroxyl groups+carboxyl groups, between 80 and 100, inclusive expressed as mg of KOH per g of alkyd (A).

4,294,735

COATING COMPOSITIONS

John Bentley, and Morice Thompson, both of Maidenhead, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 896,597, Apr. 14, 1978, abandoned. This application Jan. 22, 1980, Ser. No. 114,316

Claims priority, application United Kingdom, Apr. 25, 1977, 17124/77

Int. Cl.³ C09D *3/48, 3/66, 5/02*

U.S. Cl. 260—22 CB **12 Claims**

1. A coating composition in which the film-forming material consists of:

(a) from 30% to 85% by volume of a disperse phase consisting of particles having a size or size distribution in the range 0.01 to 20 microns, not less than 50% by volume of those particles consisting of non-crosslinked polyester microparticles, and the disperse phase being in a state of stable dispersion maintained by means of an amphipathic dispersing agent in a substantially deflocculated, sterically stabilized state of dispersion in

(b) from 70% to 15% by volume of a liquid continuous phase in which said polyester is insoluble, the continuous phase having a viscosity of from 0.1 to 20 poise at room temperature, being capable of curing to a film-forming polymer by an autoxidative polymerisation reaction and consisting of a homogeneous mixture of:

(i) an autoxidisable derivative of a polyhydric alcohol such that in each molecule of the derivative there are present from 4 to 12 autoxidisable groupings bound by ester or ether linkages to a polyhydric alcohol residue, the said derivative having a boiling point in excess of 150° C., and

(ii) a liquid compound of viscosity less than 2 poise at room temperature which contains in the molecule at least one unsaturated grouping correactive with the autoxidisable groupings in (i) but which is not itself capable of undergoing autoxidative polymerisation, the said compound having a boiling point in excess of 150° C.; the total volume of (a) and (b) being 100% and the autoxidisable groupings constituting at least 30% of the total number of autoxidisable and coreactive groupings in the continuous phase.

4,294,736

ACCELERATED PROCESS FOR MAKING NONLINEAR POLYESTERS

William H. Burgess, III, Newark, Del., and Philip Heiberger, Broomall, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 24, 1980, Ser. No. 132,839

Int. Cl.³ C08G *63/48;* **C09D** *3/64*

U.S. Cl. 260—22 M **14 Claims**

1. In a process for the manufacture of an alkyd resin by reaction between a polybasic acid, a polyhydric alcohol and a fatty acid under reaction temperature conditions with removal of water formed in the process, the improvement which comprises carrying out this reaction in 15–50% by weight, based on the weight of the reaction ingredients, of an inert volatile organic solvent.

4,294,737

WATER SOLUBLE EPOXY ESTER COPOLYMERS FOR INTERIOR CAN USE

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 108,283, Dec. 28, 1979. This application May 27, 1980, Ser. No. 153,429

Int. Cl.³ C08L *35/02*

U.S. Cl. 260—29.2 EP **11 Claims**

1. An aqueous dispersion comprising water having dispersed therein in the form of a salt with an amine an epoxy ester copolymer comprising a polyepoxide having a 1,2-epoxy equivalency in excess of 1.0 and a molecular weight of from 350 to 8000 esterified with at least about 0.5% of the copolymer of a monoester of a saturated monohydric alcohol with a monoethylenically unsaturated dicarboxylic acid which resists homopolymerization, said polyepoxide ester being copolymerized with from 15% to 70% of monoethylenic monomers, based on the weight of the copolymer, and said monoethylenic monomers including carboxy functional monomer providing an acid number of from 20–150 in the copolymer.

4,294,738

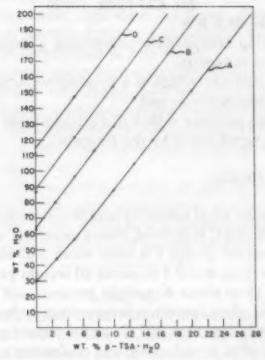
WATER-EXTENDIBLE OLIGOMER SOLUTIONS AND COATINGS THEREFROM

Aleksander Beresniewicz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 28, 1980, Ser. No. 201,468

Int. Cl.³ C08L *61/20*

U.S. Cl. 260—29.4 UA **5 Claims**



1. Coating solution consisting essentially of:

(a) about 30 to 75 wt % of the following non-volatile ingredients which are present in amounts, relative to each other:

(i) 30 to 80 wt % of an oligomer having a degree of polymerization (DP) of about 10 to about 50 and a polyalkylene ether glycol having a molecular weight of about 400 to about 1300, the amount of glycol being 0 to 60 wt % of the amount of oligomer;

(ii) 2 to 12 wt % of a non-volatile, water-miscible compound selected from p-toluenesulfonic acid, trifluorosulfonic acid, 5-sulfosalicyclic acid, 1-naphthalene-sulfonic acid, 2,5-dimethylbenzene-sulfonic acid, the sodium salts of the above acids, the sodium salts of aliphatic monocarboxylic acids having 6 to 12 carbon atoms, ammonium benzoate, and sodium di-2-ethylhexylsulfosuccinate;

(iii) 5 to 65 wt % of an amine-aldehyde cross-linking resin; and

(iv) 0 to 10 wt % of an acidic curing catalyst;

and

(b) 25 to about 70 wt % of the following volatile ingredients which are present in amounts, relative to each other:

(i) 5 to 70 wt % of water-miscible organic solvent; and

(ii) 30 to 95 wt % of water,

with the sum of the weight percentages being 100% for each of (a) and (b); (i), (ii), (iii) and (iv) of (a); and (i) and (ii) of (b), and with the proviso that the amounts of non-volatile ingredients, water and organic solvent are such that the coating solution contains not more than 250 g of volatile organic compounds per liter of solution, excluding water, the oligomer of (a) (i) being prepared by uniformly copolymerizing, using free radical initiation, in the presence of about 0.5 to about 10 wt % of a mercaptan of the formula R^2SH wherein R^2 is hydroxyalkyl or alkyl of 2 to 10 carbon atoms:

(a) 0 to about 80 wt % of a monomer selected from vinyl acetate, vinyl propionate, N-vinyl pyrrolidone, acrylamide, acrylonitrile, vinyl chloride, methyl vinyl ether, ethyl vinyl ether, and styrene; provided, however, the amount of styrene shall not exceed 60 wt %;

(b) about 5 to about 50 wt % of a monomer selected from hydroxyethyl and hydroxypropyl acrylates and methacrylates; and

(c) 0 to about 80 wt % of a monomer selected from alkyl acrylates and alkyl methacrylates, wherein alkyl is of 1 to 8 carbon atoms,

with the sum of the weight percentages being 100%.

4,294,739

ANTISTATIC COMPOSITIONS COMPRISING CROSSLINKABLE LATEX BINDERS

Donald A. Upson; Gerald A. Campbell, both of Webster, and Diane E. Kestner, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 26, 1979, Ser. No. 33,617

Int. Cl.³ C08L *35/06*

U.S. Cl. 260—29.6 RW **25 Claims**

1. A coating composition comprising a mixture of at least two different polymers:

a. a first polymer which is a conductive, water-dispersible, particulate polymer and

b. a second polymer which is a crosslinkable latex polymer binder, represented by the formula:

$$-(A)_x(B)_y(C)_z$$

wherein A is an alkyl methacrylate, B is styrene or a haloalkyl methacrylate and C is derived from a monomer which contains an active epoxide group; x is from about 5 to about 80 weight percent; y is from about 5 to about 80 weight percent; and z is from about 15 to about 40 weight percent; said latex polymer having a first glass transition temperature before crosslinking of substantially less than 50° C. and a second glass transition temperature after crosslinking and coalescing of substantially greater than 50° C.

4,294,740

PROCESS FOR PREPARING ACRYLIC RESIN EMULSIONS

Ryuzo Mizuguchi, Yawata; Shinichi Ishikura, Osaka; Keizou Ishii, Ashiya, and Tamotu Yoshioka, Osaka, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Apr. 23, 1980, Ser. No. 143,923

Claims priority, application Japan, Apr. 23, 1979, 54-50726

Int. Cl.³ C08F *2/22*

U.S. Cl. 260—29.6 RB **1 Claim**

1. In a process for preparing a substantially lump-free acrylic resin emulsion by emulsion polymerization of one or more acrylic monomers in water in the presence or absence of an emulsifier or a dispersing agent and then filtering the polymerization product, the improvement which comprises performing the polymerization in the presence of a water-insoluble resin which is immiscible with the acrylic resin in the emulsion and has a softening or melting point of 20° C. or higher, said water-insoluble resin being a chlorinated polyethylene or a chlorinated polypropylene.

4,294,741

CATIONIC POLYMERS AND THEIR USE IN ELECTRODEPOSITION

Joseph F. Bosso, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 23, 1980, Ser. No. 162,224

Int. Cl.³ C08L *63/10*

U.S. Cl. 260—29.6 NR **32 Claims**

1. A stable, aqueous dispersion of a cationic polymeric product prepared by polymerizing in aqueous medium under free radical initiated addition polymerization conditions:

(A) an aqueous dispersed phase of a polymerizable, ethylenically unsaturated monomer composition, in the presence of

(B) a quaternary ammonium base group-containing polymer which is formed from reacting a polyepoxide with an unsaturated tertiary amine in the presence of a proton source.

4,294,742

PLASTICIZED VINYL RESINS CONTAINING A LINEAR MONO C_{12}ALKYL DIPHENYL COMPOUND

Donald F. Rugen, Wilmington, Del., and Alan F. Dickason, Delaware, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Apr. 15, 1980, Ser. No. 140,636

Int. Cl.³ C08K *5/01*

U.S. Cl. 260—31.8 H **2 Claims**

1. A plasticized polyvinylchloride resin containing a primary plasticizer and as a secondary plasticizer a linear monoalkyl diphenyl wherein said alkyl group contains 12 carbon atoms.

4,294,743

EPOXY AMIDE

William F. Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

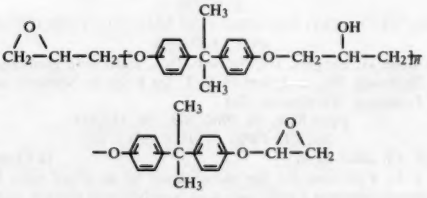
Division of Ser. No. 27,444, Apr. 5, 1979, which is a continuation-in-part of Ser. No. 848,638, Nov. 4, 1977, abandoned. This application Jun. 6, 1980, Ser. No. 157,453

Int. Cl.³ C08L *63/00*

U.S. Cl. 260—32.8 EP **4 Claims**

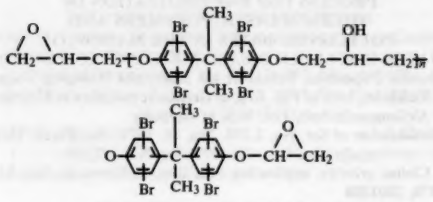
1. A composition comprising 50–70% by weight of a reaction product and about 30–50% by weight of a solvent selected from the group consisting of acetone, methylene dichloride, cyclohexanone, pentanedione, methyl-N-amyl ketone, methylisobutyl ketone, methylethyl ketone; and mixtures thereof; wherein the reaction product consists essentially of about

(a) 10–96% by weight, based on the weight of the reaction product, of a blend of the following



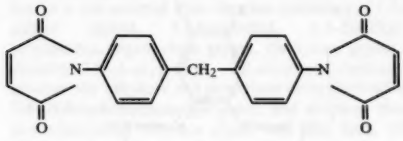
wherein n is a positive integer sufficient to provide a viscosity of 16,000–25,000 centipoises measured at 25° C. and having an epoxide equivalent of about 180–300 and

(b) a brominated epoxy resin of the formula



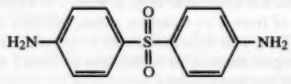
wherein n is a positive integer sufficiently large to provide a viscosity of 250–4,000 centipoises measured at 25° C., and the resin having an epoxide equivalent of about 300–800;

(2) 2–60% by weight, based on the weight of the reaction product, of a bismaleimide of the formula



wherein (1) and (2) are reacted for about 0.5–2 hours at about 115°–135° C. and subsequently reacting the product of (1) and (2) with

(3) 2–30% by weight, based on the weight of the reaction product, of a diamine of the formula



to form the reaction product;

wherein the molar ratio of bismaleimide to diamine is about 0.6–0.8.

4,294,744

PROCESS FOR FORMING A POWDERED EPDM TERPOLYMER (C-955)

Robert R. Klein, Berkeley Heights, N.J., and Henry S. Makowski, deceased, late of Scotch Plains, N.J. (by Patricia Makowski, executrix), assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 1, 1980, Ser. No. 136,366

Int. Cl.³ C08F 6/12

U.S. Cl. 260—33.6 AQ **5 Claims**

1. A process for forming a powdered EPDM terpolymer, wherein the powder of said EPDM terpolymer has a volume density of about 10 to about 30 lb/ft³ which consists of the steps of:

(a) adding a cement of said EPDM terpolymer in a hydrocarbon solvent to about room temperature water, a volume ratio of said water to said cement being about 60 to 1 to about 2 to 1;

(b) emulsifying under high-shear the blend of said water and said cement thereby forming a dispersion of particles of said EPDM terpolymer in said water;

(c) steam stripping under high agitation said emulsified blend of said EPDM terpolymer, said water and said solvent thereby removing said solvent from said emulsified blend;

(d) filtering said dispersion of said particles of said EPDM terpolymer in said water to recover a wet powder of said EPDM terpolymer; and

(e) hot-air drying said wet powder of said EPDM terpolymer in a fluid-bed dryer, tunnel dryer or flash dryer.

4. A process for forming a powdered EPDM terpolymer, wherein the powder of said EPDM terpolymer has a volume density of about 10 to about 30 lb/ft³ which consists of the steps of:

(a) adding a cement of said EPDM terpolymer in a hydrocarbon solvent to about room temperature water, a volume ratio of said water to said cement being about 60 to 1 to about 2 to 1;

(b) emulsifying under high-shear the blend of said water and said cement thereby forming a dispersion of particles of said EPDM terpolymer in said water;

(c) steam stripping under high agitation said emulsified blend of said EPDM terpolymer, said water and said solvent thereby removing said solvent from said emulsified blend;

(d) filtering said dispersion of said particles of said EPDM terpolymer in said water to recover a wet powder of said EPDM terpolymer;

(e) hot-air drying said wet powder of said EPDM terpolymer in a fluid-bed dryer, tunnel dryer or flash dryer; and

(f) adding a non-polar process oil to said cement prior to adding said water to said cement, said oil being added at a concentration of about 20 to about 200 parts by weight per 100 parts by weight of the EPDM terpolymer.

5. A process for forming a powdered EPDM terpolymer, wherein the powder of said EPDM terpolymer has a volume density of about 10 to about 30 lb/ft³ which consists of the steps of:

(a) adding a cement of said EPDM terpolymer in a hydrocarbon solvent to about room temperature water, a volume ratio of said water to said cement being about 60 to 1 to about 2 to 1;

(b) emulsifying under high-shear the blend of said water to said cement thereby forming a dispersion of particles of said EPDM terpolymer in said water;

(c) steam stripping under high agitation said emulsified blend of said EPDM terpolymer, said water and said solvent thereby removing said solvent from said emulsified blend;

(d) filtering said dispersion of said particles of said EPDM terpolymer in said water to recover a wet powder of said EPDM terpolymer;

(e) hot-air drying said wet powder of said EPDM terpolymer in a fluid-bed dryer, tunnel dryer or flash dryer; and

(f) dry blending an oil, a filler or a polyolefinic thermoplastic or mixture thereof with said formed powder.

4,294,745

CURABLE MIXTURE FOR PRODUCING REINFORCED ELASTOMERIC PLASTICS BASED ON EPOXIDE RESIN

Rolf Schmid, Gelterkinden, and Friedrich Lohse, Oberwill, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 4, 1980, Ser. No. 109,739

Claims priority, application Switzerland, Jan. 16, 1979, 403/79; Jan. 16, 1979, 404/79

Int. Cl.³ C08L 63/00

U.S. Cl. 260—37 EP **11 Claims**

1. A curable mixture containing

(1) an epoxide resin, and

(2) a curing agent for epoxide resins, wherein

(a) at least one of the components (1) and (2) is at least trivalent,

(b) the components (1) and (2) together consist to the extent of at least 60 percent by weight of aliphatic chain segments,

(c) the number of atoms in the chains of components (1) and (2) between two active groups is 25 to 700, a phenylene group being reckoned to have 4 atoms, and

(d) the components (1) and/or (2) contain aliphatic chain segments in the form of polyester or polyether groups, or hydrocarbon radicals unsubstituted or substituted in the side chain; the curable mixture also containing

(2) an amount of 1 to 20 percent by weight, relative to the total amount of components (1) to (2), of needle-shaped to rod-shaped crystals which are insoluble in epoxide resin, and which have a length of 0.1 to 600 μm, a thickness of 0.01 to 60 μm, a length/thickness ratio of 3 to 200, and a density of 1.3 to 3.0.

4,294,746

STABILIZERS FOR CYCLOALIPHATIC EPOXIDE CONTAINING COMPOSITIONS

Eskel B. Blair, St. Albans, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 17, 1980, Ser. No. 160,287
Int. Cl.³ C08G *59/68, 59/72*
U.S. Cl. 260—37 EP **26 Claims**

1. A stabilized curable composition comprising a cycloaliphatic epoxide, a Bronsted or Lewis acid catalyst and a stabilizing amount of a compound containing at least one nitrile and/or isocyanate group.

4,294,747

SHAPEABLE THERMOPLASTIC RESIN COMPOSITION CONTAINING CYCLIC ACETAL

Tien-Kuei Su, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 78,315, Sep. 24, 1979, abandoned. This application Aug. 18, 1980, Ser. No. 178,753
Int. Cl.³ C08K *5/06*
U.S. Cl. 260—37 R **12 Claims**

1. A shapeable resin composition which consists essentially of a thermoplastic, condensation polymer substantially free of olefinic unsaturation having an intrinsic viscosity of from about 0.1 to 5 measured at 25° C. in a mixture of equal parts by volume of sym-tetrachloroethane and phenol and an effective minor amount sufficient to improve crystallization properties of a cyclic acetal as a nucleating agent, said cyclic acetal being at least one member selected from the polyhydric alcohol acetals of benzaldehyde or derivatives thereof wherein the benzene ring of said benzaldehyde moiety is substituted with at least one substituent selected from the group consisting of halogen substituents, alkyl groups having one to eight carbon atoms, and alkoxy groups having one to eight carbon atoms, said polyhydric alcohols having 5 to 7 hydroxyl groups.

4,294,748

LOW VISCOSITY UNSATURATED POLYESTER RESINS

Giovanni Corrado, 190, Via Gentile da Mogliano, Roma; Elvio Bertotti, 45, Corso Garibaldi, Colleferro, Roma, and Bruno Sopino, 21, Via Belvedere, Colleferro, all of Italy

Filed Dec. 27, 1979, Ser. No. 107,708
Claims priority, application Italy, Dec. 29, 1978, 31404 A/78
Int. Cl.³ C08L *91/00*; C08G *63/52*
U.S. Cl. 260—22 CB **4 Claims**

1. Low viscosity unsaturated polyester resins for making products, optionally reinforced with glass fibers, by conventional polyester resin processing techniques, essentially comprising:

(A) an alkyd prepared by esterification of (a) a compound selected from the group consisting of maleic anhydride, maleic acid, fumaric acid, and mixtures thereof in association with isophthalic acid, with (b) one or more glycols, essentially comprising dipropylene glycol, and at least

(B) one monomer copolymerizable with (A), selected from the group consisting of styrene, toluene, and mixtures thereof, in an amount of 25–40% by weight of the total (A)+(B), said unsaturated polyester resins being characterized in that said alkyd A has a molecular weight/double bond factor between 300 and 390 and an amount of free functional groups constituted by hydroxyl groups+-carboxyl groups, of between 50 and 85, inclusive expressed as mg of KOH per g of alkyd.

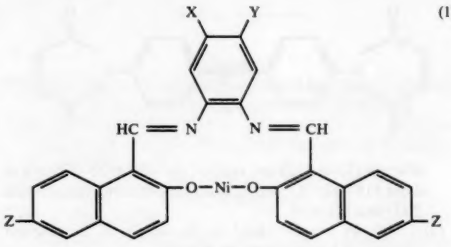
4,294,749

PROCESS FOR THE COLORATION OF THERMOPLASTIC POLYMERS AND POLYCONDENSATES IN THE MASS WITH WATER-INSOLUBLE DISAZO-METHINE COMPOUNDS

Theodor Papenfuhs, Frankfurt am Main, and Wolfgang Teige, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 2,250, Jan. 10, 1979, abandoned. This application Dec. 28, 1979, Ser. No. 107,936
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801288
Int. Cl.³ C08L *67/00*; C09B *55/00*
U.S. Cl. 260—40 P **5 Claims**

1. In a process for spin-dyeing a water-insoluble thermoplastic polyester with a nickel-complex disazomethine coloring compound, the improvement consisting of spinning a melt of said polyester containing dissolved therein, as the coloring compound, a disazomethine compound of the formula (1)



(1)

in which

X and Y each is hydrogen, alkyl of from 1 to 4 carbon atoms, alkoxy of from 1 to 4 carbon atoms, carboxy or carbalkoxy of from 1 to 4 carbon atoms in the alkyl moiety, and

Z is hydrogen, carboxy or carbalkoxy of from 1 to 4 carbon atoms in the alkyl moiety,

X, Y and Z being identical or different to each other, with the proviso that either X or Y or both are not hydrogen if Z is hydrogen.

4,294,750

PYROPLASTOID PARTICLES, COMPOSITION AND METHOD OF PRODUCTION

Richard M. Klingaman, Philadelphia, Pa., and Leo C. Ehrenreich, Amherst, N.Y., assignors to Penn Virginia Corporation, Philadelphia, Pa.

Division of Ser. No. 921,523, Jul. 3, 1978, abandoned, which is a continuation of Ser. No. 786,513, Apr. 11, 1977, abandoned. This application Feb. 25, 1980, Ser. No. 124,043
Int. Cl.³ C08L *67/00*
U.S. Cl. 260—40 R **28 Claims**

1. A composite comprising from about 15 to 99% by volume of one or more polymeric media and about one to about 85% of particulate material composed of particles:

at least about 85% of which (number basis) have a well-defined, regular, ellipsoidal shape;

having a size less than about 25μ, with at least about 90% by weight of the particles having a size less than about 15μ and at least about 50% being less than about 10μ;

the specific surface of the particles being in the range of about 0.75 to about 2.5 square meters per gram;

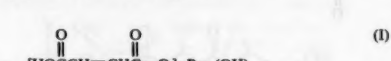
said particles having a specific gravity of about two to three, and being composed substantially of alumino-silicate glass.

4,294,751
POLYESTER RESIN COMPOSITIONS

Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 34,997, May 1, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 135,905
Int. Cl.³ C08L 67/02
U.S. Cl. 260—400 R 7 Claims

1. A curable molding composition comprising a mixture of:
(a) a polyester of the following formula



(I)

wherein n has an average value between 1.5 and 2, m is 2-n, R is the hydroxyl-free residue of a predominantly hydroxyl terminated polyester having a molecular weight not exceeding about 1500 and obtained by the condensation of a diol selected from the class consisting of 1,2-propylene glycol, 1,3-butanediol, 2,2-dimethyl-1,3-propanediol, dipropylene glycol, diethylene glycol, 2,2-dimethyl-3-hydroxypropyl 2,2-dimethyl-3-hydroxypropionate, the ethylene and propylene oxide derivatives of 2,2-bis(4-hydroxyphenyl)propane, and mixtures thereof, and mixtures of ethylene glycol and said diols, with a dicarboxylic acid or anhydride selected from the class consisting of maleic acid and anhydride, fumaric acid, ortho-phthalic acid and anhydride, isophthalic acid, terephthalic acid, carbic acid and anhydride, and mixtures thereof,
(b) maleic anhydride,
(c) an ethylenically unsaturated monomer which forms a homogeneous mixture with and is copolymerizable with (a) and (b) and
(d) one or more reinforcing fibers having a melting point or a glass transition temperature above about 130° C.

5. A composition as in claim 1 wherein the reinforcing fiber is selected from fiberglass, carbon fibers, or polyamide fibers.

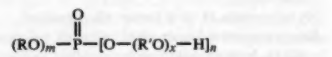
6. A composition as in claim 1 wherein the composition contains from about 15 to about 80 weight percent of the reinforcing fiber.

4,294,752
FILLED VINYL CHLORIDE POLYMER COMPOSITION

Joseph Silberberg, Brooklyn, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 14, 1980, Ser. No. 111,626
Int. Cl.³ C08K 9/04, 5/52
U.S. Cl. 260—42.14 7 Claims

1. A filled vinyl chloride polymer composition having improved processing characteristics and impact resistance comprising a vinyl chloride polymer, a filler, and an effective amount for said improved processing and impact resistance of a composition comprising a lower alkoxylated alkyl acid phosphate ester having the formula



where x is an integer of from 1 to 5, m and n are either 1 or 2, with the sum of m and n being 3, R is a C_1–C_{20} alkyl group, and R′ is a C_2–C_5 alkyl group.

4,294,753
BONE MORPHOGENETIC PROTEIN PROCESS

Marshall R. Urist, Pacific Palisade, Calif., assignor to The Regents of the University of California, Calif.

Filed Aug. 4, 1980, Ser. No. 174,906
Int. Cl.³ C07G 7/00
U.S. Cl. 260—112 R 17 Claims

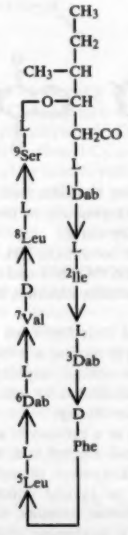
1. The process of separating bone morphogenetic protein (BMP) from bone tissue comprising the steps of:
(a) demineralizing bone tissue;
(b) treating said demineralized bone tissue under aqueous conditions with a water soluble neutral salt and a solubilizing agent for said BMP, said agent being selected from the group consisting of urea and guanidine, and thereby transforming the bone collagen to gelatin and extracting BMP into said solution of solubilizing agent; and
(c) separating said solubilizing agent and neutral salt from said solution, thereby precipitating BMP in the aqueous medium.

4,294,754
RING PEPTIDE ANTIBIOTICS, PERMETIN A AND A PROCESS FOR PRODUCING THE SAME

Yoshiyuki Takahara, Tokyo; Yoshiteru Hirose, Kamakura; Yoko Takeuchi; Asao Murai, both of Tokyo; Masatsune Kainosho, Kawasaki, and Sawao Murao, Sakai, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Apr. 4, 1979, Ser. No. 27,029
Claims priority, application Japan, Apr. 7, 1978, 53-40999
Int. Cl.³ C07C 103/52; C12P 21/04
U.S. Cl. 260—112.5 R 1 Claim

1. A purified ring peptide antibiotic having the following empirical formula:
Nα-(3-hydroxy-4-methyl-1-oxohexyl)-L-α, γ-diaminobutyrl-L-isoeucyl-L-α,γ-diaminobutryl-D-phenylalanyl-L-leucyl-L-α,γ-diaminobutyrl-D-valyl-L-leucyl-L-serine(9-1)-lactone;
and which has the following structural formula:



and wherein Dab represents 2,4-diamino butyric acid.

4,294,755

PIGMENTS CONTAINING PYRAZOLO QUINAZOLONE RADICALS

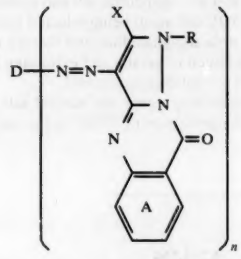
Hartmut Kanter, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Herne, Fed. Rep. of Germany

Filed Oct. 10, 1979, Ser. No. 83,327

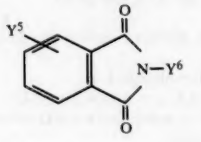
Int. Cl.[3] **C09B** *29/01, 29/52, 35/233, 35/26*

U.S. Cl. 260—154 **6 Claims**

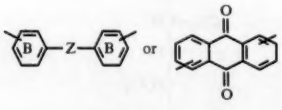
1. An azo compound of the formula:



wherein D is an unsubstituted anthraquinone radical or an anthraquinone radical substituted by one or more substituents selected form the group consisting of chlorine, bromine, $NHCOCH_3$, CH_3, $NHCOC_6H_5$ or $NHCOC_6H_4Cl$; or D is a amino phthalimide radical of the formula:



or D is the radical of a tetraazo component $H_2N—D—NH_2$ having the formulae:



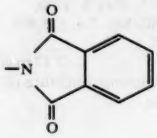
Y^5 is hydrogen, chlorine, bromine, methyl or cyano; and Y^6 is hydrogen, phenyl, benzoylamino, or phenyl or benzoylamino which are substituted by nitro;

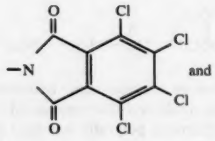
wherein Z is a direct bond, SO_2, NH, CO, SO_2NH, CONH, NHCONH, or NHCOCONH and the rings B are unsubstituted or substituted by chlorine, bromine, methyl, nitro, or methoxy;

wherein said radical D is free from complex-forming hydroxyl and carboxyl groups; n is one or two;

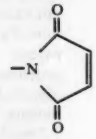
R is hydrogen or a phenyl, naphthyl or pyridyl radical which may be substituted by chlorine, bromine, nitro, methyl, methoxy or ethoxy;

X is hydroxyl, alkyl or a carboxylic acid alkyl ester having an alkyl ester radical selected from the group consisting of C_1–C_6 alkyl or alkoxyalkyl, phenyl and benzyl; or X is phenyl, naphthyl or pyridyl which is unsubstituted or substituted by chlorine, bromine, nitro, methyl, methoxy or ethoxy; or X is acylamino selected from the group consisting of $NHCOCH_3$, $NHCOC_2H_5$, $NHCOC_3H_7$, $NHCOC_6H_5$, $NHCOC_6H_4Cl$, $NHCOC_6H_3Cl_2$, $NHCOC_6H_4Br$, $NHCOC_6H_4OCH_3$, $NHCOC_{10}H_7$, $NHCONH_2$, $NHCONHC_6H_5$,





and



and the ring A is a substituted or unsubstituted, with a proviso that said ring A is free from SO_3H groups.

4,294,756

CATIONIC DYESTUFFS

Hans-Peter Kühlthau, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

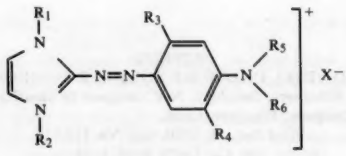
Filed Aug. 13, 1979, Ser. No. 65,775

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1978, 2837987

Int. Cl.[3] **C09B** *29/22*

U.S. Cl. 260—163 **10 Claims**

1. Dyestuffs of the formula



wherein

R_1 and R_2 independently of one another represent a lower alkyl, alkenyl or hydroxyalkyl radical,

R_3 represents H or halogen,

R_4 represents H, halogen, or a lower alkyl, alkenyl or alkoxy radical,

R_5 represents H or a lower alkyl radical,

R_6 represents a lower alkyl, alkenyl, halogenoalkyl, alkoxyalkyl, hydroxyalkyl or cyanoalkyl radical and

X^- represents an anion,

at least one of the substituents R_3 and R_4 being other than H, and at least one of R_3 and R_5 being hydrogen.

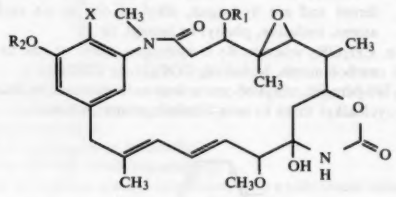
4,294,757

20-O-ACYLMAYTANSINOIDS

Mitsuko Asai, Takatsuki, Japan, assignor to Takeda Chemical Industries, Ltd, Osaka, Japan

Filed Jan. 15, 1980, Ser. No. 112,237
Claims priority, application Japan, Jan. 31, 1979, 54-10551
Int. Cl.[3] C07D *498/18*
U.S. Cl. 260—239.3 P 37 Claims

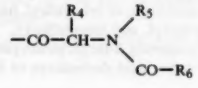
1. A compound of the formula:



wherein X is chlorine or hydrogen, R_1 is hydrogen or acyl; R_2 is acyl; said acyl being represented by the formula:

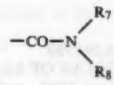
$$—CO—R_3 \quad (a)$$

wherein R_3 is hydrogen, C_{1-18} alkyl, C_{2-18} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkenyl, heterocyclic group selected from the group consisting of azetidinyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 1,2,3,4-tetrahydropyridyl, piperidyl, quinolyl, 1,2-dihydroquinolyl, 3-isoquinolyl, 4-isoquinolyl, 1,2-dihydroisoquinolyl, pyrrolyl, pyrrolinyl, pyrrolidinyl, indolyl, furyl, pyranyl, dihydropyranyl, benzofuryl, benzopyranyl, thienyl, benzothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, 2-imidazolyl, imidazolidinyl, benzoimidazolyl, indazolyl, quinoxalyl, quinazolinyl, cinnolinyl, 1,4-dioxanyl 1,4-benzodioxanyl, 1,2-dithiolanyl, 1,3-dithiolanyl, 1,3-dithianyl, isooxazolyl, oxazolyl, morpholinyl, benzoisoxazolyl benzoxazolyl, isothiazolyl, thiazolyl, benzoisothiazolyl, benzothiazolyl, benzothiazinyl, 1,2,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, 1,2,5-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,3-triazolyl, 1,2,5-triazolyl, 1,3,4-triazolyl, 1,3,5-triadinyl, benzotriazolyl and 1,2,3,4-tetrazolyl, said cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being attached directly to the carbonyl carbon or through a C_{1-4} alkylene chain, said alkyl, alkenyl, cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being unsubstituted or substituted by C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-C_{1-4}-alkylamino, C_{1-4} alkylthio methylsulfinyl, methylsulfonyl, oxo, thioxo, C_{1-4} alkanoylamido or carboxy group of the formula -$COOR_{12}$ wherein R_{12} is hydrogen, C_{1-6} alkyl, phenyl or benzyl, and said cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being unsubstituted or substituted by C_{1-4} alkyl;



(b)

wherein R_4 is hydrogen, C_{1-18} alkyl, C_{3-10} cycloalkyl, phenyl, indolyl or imidazolyl group, said cycloalkyl, phenyl, indolyl or imidazolyl groups being attached directly to the alpha-carbon atom or, through a C_{1-4} alkylene chain, said alkyl, cycloalkyl, phenyl, indolyl or imidazolyl being unsubstituted or substituted by C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-C_{1-4}-alkylamino, C_{1-4} alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or C_{1-4} alkanoylamido, and said cycloalkyl, phenyl, indolyl or imidazolyl being unsubstituted or substituted by C_{1-4} alkyl; R_5 is hydrogen, C_{1-18} alkyl, C_{3-10} cycloalkyl, C_{4-14} cycloalkylalkyl, phenyl or benzyl group, said alkyl, cycloalkyl, cycloalkylalkyl, phenyl or benzyl group being unsubstituted or substituted by C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-C_{1-4}-alkylamino, C_{1-4} alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or C_{1-4} alkanoylamido, and said cycloalkyl, cycloalkylalkyl, phenyl or benzyl group being unsubstituted or substituted by C_{1-4} alkyl; R_6 is hydrogen, C_{1-7} alkoxy, bornyloxy, isobornyloxy, benzyloxy, C_{1-18} alkyl, C_{2-18} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkenyl, phenyl or heterocyclic group selected from the group consisting of azetidinyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 1,2,3,4-tetrahydropyridyl, piperidyl, quinolyl, 1,2-dihydroquinolyl, 3-isoquinolyl, 4-isoquinolyl, 1,2-dihydroisoquinolyl, pyrrolyl, pyrrolinyl, pyrrolidinyl, indolyl, furyl, pyranyl, dihydropyranyl, benzofuryl, benzopyranyl, thienyl, benzothienyl, imidazolyl, pyrazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, 2-imidazolyl, imidazolidinyl, benzoimidazolyl, indazolyl, quinoxalyl, quinazolinyl, cinnolinyl, 1,4-dioxanyl, 1,4-benzodioxanyl, 1,2-dithiolanyl, 1,3-dithiolanyl, 1,3-dithianyl, isooxazolyl, oxazolyl, morpholinyl, benzoisoxazolyl, benzoxazolyl, isothiazolyl, thiazolyl, benzoisothiazolyl, benzothiazolyl, benzothiazinyl, 1,2,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,3-thiadiazolyl, 1,2,4-thiadiazolyl, 1,2,5-thiadiazolyl, 1,3,4-thiadiazolyl, 1,2,3-triazolyl, 1,2,5-triazolyl, 1,3,4-triazolyl, 1,3,5-triadinyl, benzotriazolyl and 1,2,3,4-tetrazolyl, said cycloalkyl, cycloalkenyl, phenyl or heterocyclic groups being attached directly to the carbonyl carbon atom adjacent the nitrogen atom or through a C_{1-4} alkylene chain, said alkyl, alkenyl, cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being unsubstituted or substituted by C_{1-4} alkoxy, C_{2-4} alkanoyl, C_{2-4} alkanoyloxy, C_{2-4} alkoxycarbonyl, halogen, nitro, cyano, trifluoromethyl, di-C_{1-4}-alkylamino, C_{1-4} alkylthio, methylsulfinyl, methylsulfonyl, oxo, thioxo or C_{1-4} alkanoylamido, and said cycloalkyl, cycloalkenyl, phenyl or heterocyclic group being unsubstituted or substituted by C_{1-4} alkyl;



(c)

wherein R_7 and R_8 may be the same or different and each is hydrogen, C_{1-18} alkyl, C_{2-18} alkenyl, C_{3-10} cycloalkyl, C_{3-10} cycloalkenyl, C_{4-14} cycloalkylalkyl, C_{4-10} cycloalkenylalky phenyl, phenyl-C_{1-4}-alkyl, phenyl-C_{3-10}-cycloalkyl, C_{3-10} cycloalkylphenyl, biphenyl or heterocyclic group selected from the group consisting of azetidinyl, pyrrolyl, furyl, thienyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, pyrazolyl, imidazolyl, pyridyl, pyrimidinyl, pyrazinyl, triazinyl, quinolyl, quinazolyl, quinoxalyl, indolyl, benzofuranyl and benzothienyl, and wherein R_7 and R_8 together may form a heterocyclic group of azetidinyl, pyrrolidinyl, piperadinyl or morpholinyl taken together with the adjacent nitrogen atom, these groups being unsubstituted or substituted by C_{1-4} alkoxy, C_{1-4} alkylthio, phenoxy, phenylthio, cyclohexyloxy, halogen, cyano, C_{2-5} alkoxycarbonyl, benzyloxycarbonyl, nitro, aminosulfonyl or di-C_{1-4}-alkylamino, and said cyclic moiety or heterocyclic group being unsubstituted or substituted by C_{1-4} alkyl; or

$$—CO—O—R_9 \quad (d)$$

wherein R_9 is C_{1-18} alkyl, C_{3-10} cycloalkyl, phenyl or phenyl-C_{1-4}-alkyl, said groups being unsubstituted or substituted by

C_{1-4} alkoxy, phenoxy, benzyloxy, halogen or cyano, and said cyclic moiety being unsubstituted or substituted by C_{1-4} alkyl.

4,294,758

7-ISOCYANATO-1,4-BENZODIAZEPIN-2-ONES

Albert E. Fischli, and Andre Szente, both of Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

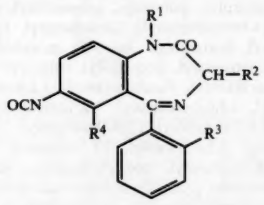
Division of Ser. No. 63,288, Aug. 2, 1979, Pat. No. 4,251,443. This application Sep. 11, 1980, Ser. No. 186,094

Claims priority, application Switzerland, Aug. 11, 1978, 8563/78; Jun. 6, 1979, 5270/79; Jul. 5, 1979, 6296/79

Int. Cl.³ C07D *243/24*

U.S. Cl. 260—239.3 D **2 Claims**

1. A compound of the formula



II

wherein R^1 represents lower alkyl, R^2 represents a hydrogen atom or lower alkyl, R^3 represents a halogen atom and R^4 represents a hydrogen or halogen atom.

4,294,759

STRUCTURAL ANALOGUES OF 5,6,-DIHYDRO PG_1

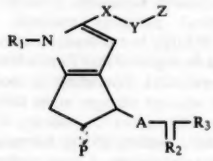
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 94,572, Nov. 15, 1979, abandoned. This application Jun. 16, 1980, Ser. No. 159,738

Int. Cl.³ C07D *209/12*

U.S. Cl. 260—326.27 **9 Claims**

1. A compound of the formula



Formula I

wherein P is H, $\overline{O}H$, or $\overline{C}H_2OH$;

X is $(CH_2)_n$ wherein n is 2 or 4;

Y is $CH_2—CH_2$, —CH=CH— (trans), or CH_2CF_2;

Z is

a. CO_2R_8 wherein R_8 is hydrogen, alkyl of one to six carbon atoms, inclusive, phenyl or a pharmacologically acceptable metal or amine cation, phenyl, phenyl substituted with one, two or three chloro or alkyl of one to three carbon atoms, inclusive, phenyl substituted in the para position by

(i) $NHCOR_{10}$

(ii) COR_{11}

(iii) $OCOR_{12}$

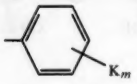
(iv) $CH=NNHCONH_2$

wherein R_{10} is methyl, phenyl, acetamidophenyl, benzamidophenyl or NH_2, R_{11} is methyl, phenyl, NH_2 or methoxy; and R_{12} is phenyl or acetamidophenyl;

b. $CONR_{13}R_{14}$ wherein R_{13} and R_{14} are the same or different and are hydrogen, alkyl of one to six carbon atoms, inclusive, phenyl or benzyl, or

c. CH_2OR_5 wherein R_5 is hydrogen, alkyl or one to six carbon atoms, inclusive, COC_6H_5 or $COCH_3$;

R_1 is hydrogen, alkyl of one to four carbon atoms, inclusive, cycloalkyl three to seven carbon atoms, inclusive,



wherein Km is as defined above, the Km of E being the same or different as the Km of R_1.

4,294,760

PREPARATION OF 5-(ARYLCYANOHYDROXYMETHYL)-1-LOWERALKYL-PYRROLE-2-ACETIC ACID DERIVATIVES

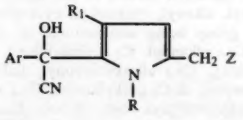
John R. Carson, Norristown, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Filed Apr. 17, 1980, Ser. No. 141,438

Int. Cl.³ C07D *207/337*

U.S. Cl. 260—326.47 **6 Claims**

1. A 5-(arylcyanohydroxymethyl)-1-loweralkylpyrrole-2-acetic acid derivative having the formula:



wherein:

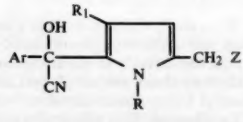
R is loweralkyl;

R_1 is hydrogen or loweralkyl;

Z is CN or COO(loweralkyl); and

Ar is phenyl or phenyl substituted with a substituent selected from the group consisting of loweralkyl, halo, nitro, methylthio, trifluoromethyl, and loweralkoxy.

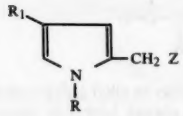
6. The process of preparing 5-(arylcyanohydroxymethyl)-1-loweralkylpyrrole-2-acetic acid derivatives of formula:



which comprises reacting an aroylcyanide of formula:

ArCOCN

with a 1-loweralkylpyrrole-2-acetic acid derivative of formula:



in the presence of an acid of pK below about 2, in an inert aprotic solvent at a temperature between 0° and 40° C., wherein in the foregoing formulae:

R is loweralkyl;

R_1 is hydrogen or loweralkyl;

Z is CN OR COO(loweralkyl);

Ar is phenyl or phenyl substituted with a substituent selected from the group consisting of loweralkyl, halo, nitro, methylthio, trifluoromethyl and loweralkoxy.

4,294,761

PREPARATION OF 7,12-DIOXASPIRO[5,6]DODECANE-3-ONE

John A. Hyatt, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,549

Int. Cl.³ C07D *321/10*

U.S. Cl. 260—338 **1 Claim**

1. Process for the preparation of 7,12-dioxaspiro[5,6]-dodecane-3-one which comprises reacting under dehydrating conditions 1,4-cyclohexanedione and 1,4-butanediol in an inert hydrocarbon solvent in the presence of an effective amount of a ketal-forming, acid catalyst.

4,294,762

PREPARATION OF α-CYANO-BENZYL ESTERS

Hellmut Hoffmann, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

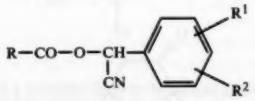
Filed May 1, 1980, Ser. No. 145,636

Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2916224

Int. Cl.³ C07C *121/66, 121/75;* C07D *317/60, 319/20*

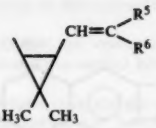
U.S. Cl. 260—340.3 **9 Claims**

1. A process for the preparation of an α-cyano-benzyl ester of the formula



in which

R represents a radical of the formula



in which

R^5 represents hydrogen, methyl, chlorine, or bromine and

R^6 represents methyl, chlorine, bromine or optionally halogen-substituted phenyl, or

R represents the radical

in which

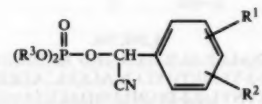
R^7 represents phenyl which is optionally substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, halogenomethyl, C_1–C_2-halogenoalkoxy, C_1–C_2-halogenoalkylthio, C_1–C_2-alkylenedioxy or C_1–C_2-halogenoalkylenedioxy and

R^8 represents isopropyl or cyclopropyl,

R^1 represents hydrogen, halogen or an optionally halogen-substituted alkyl, alkenyl, alkynyl, alkoxy, alkenoxy, alkynoxy, aralkyl or aryloxy radical and

R^2 represents hydrogen or halogen,

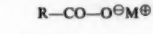
comprising reacting a phosphoric acid α-cyano-benzyl ester of the formula



in which

R^3 each independently is alkyl or phenyl or both together are alkanediyl,

with a carboxylic acid salt of the formula



in which

M represents one equivalent of an alkali metal or alkaline earth metal,

at a temperature of about 20° to 250° C.

4,294,763

INTERMEDIATES FOR THE PRODUCTION OF PICROPODOPHYLLIN AND RELATED COMPOUNDS AND PROCESSES FOR THE PREPARATION AND USE THEREOF

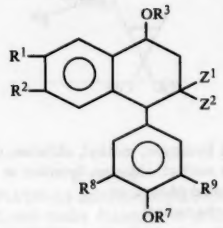
Andrew S. Kende, Pittsford, N.Y.; Dennis P. Curran, Madison, Wis.; Margaret L. King, Rochester, and Neil A. Feldstein, Westbury, both of N.Y., assignors to University of Rochester, Rochester, N.Y.

Filed Mar. 5, 1980, Ser. No. 127,436

Int. Cl.³ C07D *317/70;* C07C *69/76, 49/337*

U.S. Cl. 260—340.5 DP **8 Claims**

1. A compound of the formula:



wherein;

R^1 represents alkoxy or aralkoxy,

R^2 represents hydrogen, alkoxy or aralkoxy,

or R^1 and R^2 taken together represent the group —O—CH_2—O—,

R^3 represents hydrogen, alkyl, aralkyl, or a conventional protecting group,

Z^1 represents a non-reacting electron withdrawing group which can be readily converted to a carboxyl group,

Z^2 represents a non-reacting electron withdrawing group which can be readily converted to a carboxyl group, or hydrogen,

R^7 represents hydrogen, alkyl, aralkyl or acyl, and

R^8 and R^9 are the same or different and represent hydrogen, alkoxy or aralkoxy.

4,294,764

N-(OPTIONALLY SUBSTITUTED 1,3-DIOXOLAN- OR DIOXAN-2-YLMETHYL)-N-ALKYL, ALKENYL, OR ALKYNYL-2,2-DICHLOROACETAMIDES

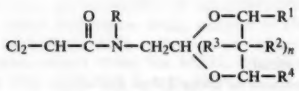
Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 26, 1979, Ser. No. 106,434

Int. Cl.³ C07D *317/10, 317/12, 319/04*

U.S. Cl. 260—340.9 R **2 Claims**

1. A compound represented by the formula:



wherein:

R is ethyl, propyl, 1-methylethyl, 2-propenyl, 2-butenyl, 2-methyl-2-propenyl, 2-propynyl, or 1,1-dimethyl-2-propynyl;

R^1, R^2, R^3, and R^4 are independently hydrogen or methyl; and

n is 0 or 1.

4,294,765

CIS-LACTONE PYRETHROID INTERMEDIATES

Petrus A. Kramer, and Pieter A. Verbrugge, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

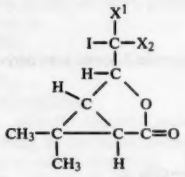
Filed Oct. 23, 1980, Ser. No. 200,227

Claims priority, application United Kingdom, Nov. 1, 1979, 37858/79

Int. Cl.³ C07D *307/93*

U.S. Cl. 260—343.3 R **3 Claims**

1. A cis-lactone of formula III



III

wherein X^1 and X^2 each represents an alkyl group containing fewer than five carbon atoms, phenyl, benzyl or phenethyl, substantially free of other stereoisomers.

4,294,766

PREPARATION OF PURE POTASSIUM RIBONATE AND RIBONOLACTONE

Wolfram Schmidt, Friedelsheim, and Joachim Paust, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,724

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852721

Int. Cl.³ C07D *307/32;* **C07C** *59/105*

U.S. Cl. 260—343.6 **5 Claims**

1. A process for the preparation of pure ribonolactone from a mixture of ribonolactone and arabonolactone, which contains 70% by weight or more of the ribonolactone, wherein the mixture is subjected to fractional crystallization from a concentrated solution in dioxane or ethylene glycol monomethyl ether at a low temperature.

2. A process for the preparation of pure potassium ribonate, comprising:

(a) epimerizing potassium arabonate in an aqueous solution at 130°–140° C. thereby forming a mixture of potassium ribonate and potassium arabonate in solution;

(b) mixing the product solution from step (a) with from 40 to 900% by wt., based on the amount of water present, of an organic solvent selected from the group consisting of C_1–C_4 alkanols, cycloaliphatic ethers, alkanediols of 2 or 3 carbon atoms which are partially etherified with methanol or ethanol and mixtures thereof and allowing most of the potassium arabonate present to crystallize from solution;

(c) removing the solvent from said aqueous potassium ribonate containing solution;

(d) concentrating the aqueous solution to a salt strength from about 40 to 60% by weight;

(e) crystallizing the potassium ribonate from the solvent free, concentrated aqueous solution at from about −2° to 10° C.

4,294,767

PROCESS FOR THE PREPARATION OF 2,5-DIMETHYL-4-HYDROXY-3(2H)-FURANONE AND ITS 2,5-DIALKYL HOMOLOGUES

Emile H. Eschinasi, Haifa, Israel, and Enrico Castelli, Leumann, Italy, assignors to Instituto per la Ricerca Scientifica e Applicata di Technologie Alimentari S.p.A, Turin, Italy

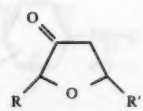
Filed Aug. 21, 1980, Ser. No. 180,179

Int. Cl.³ C07D *307/32*

U.S. Cl. 260—347.8 **8 Claims**

1. A process comprising the steps of:

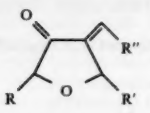
effecting an aldol condensation reaction between a 2,5-dialkyl-dihydro-3(2H)-furanone having the formula:



(I)

wherein R and R′ are each selected from the lower alkyl groups having from 1–3 carbon atoms, and an aldehyde having the formula R″CHO, wherein R″ is chosen from alkyl and isoalkyl groups having from 1 to 6 carbon atoms and aryl groups, under basic conditions at a temperature of from −10° C. to 100° C. to obtain the corresponding aldol compound;

dehydrating said aldol compound to form the corresponding exocyclic alkene having the formula:



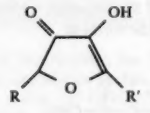
(II)

wherein R, R′ and R″ have the significations indicated above;

treating said exocyclic alkene (II) with ozone in the presence of a participating solvent selected from the group consisting of aliphatic alcohols and acyl compounds having from 1 to 4 carbon atoms, water, acetone and mixtures thereof, at a temperature of from −70° C. to 30° C. to obtain the corresponding hydroperoxyhemiacetal;

reducing said hydroperoxy-hemiacetal to the corresponding hemiacetal;

converting said hemiacetal to its corresponding 2,5-dialkyl-4-hydroxy-3(2H)-furanone having the formula:



(III)

wherein R and R′ have the significations indicated above, by refluxing under acidic conditions in an inert atmosphere; and

recovering said 2,5-dialkyl-4-hydroxy-3(2H)-furanone (III).

4,294,768

WATER-SOLUBLE ANTHRAQUINONE DYES

Jean-Marie Adam, Saint-Louis, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

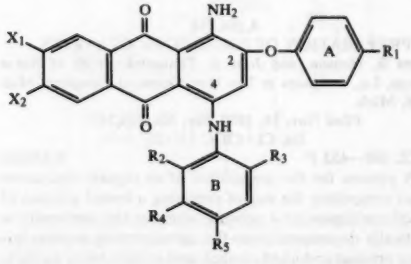
Continuation of Ser. No. 908,495, May 23, 1978, abandoned. This application May 9, 1980, Ser. No. 148,443

Claims priority, application Luxembourg, May 26, 1977, 77419

Int. Cl.³ C07C *143/675*

U.S. Cl. 260—372 **10 Claims**

1. A new water-soluble anthraquinone dye which, in the form of the free acid, corresponds to the formula I



(I)

wherein

R_1 represents a straight-chain or branched chain alkyl group having 4 to 8 carbon atoms,

R_2 and R_3 independently of one another represent a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms,

R_4 represents hydrogen, an optionally acylated amino group, or a fibre-reactive radical bonded by way of an amino group,

R_5 represents hydrogen or a straight-chain or branched-chain alkyl group having 1 to 4 carbon atoms, and the phenylene rings

A and/or B can be further substituted, with the proviso that one X of the symbols X_1 and X_2 represents the $-SO_3H-$ group, and the other X represents hydrogen.

4,294,769

PROCESS FOR THE PREPARATION OF 1,4-DIAMINO-2,3-DICYANO-ANTHRAQUINONES

Friedrich W. Kröck, Cologne; Rütger Neeff, and Heinz Scheiter, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

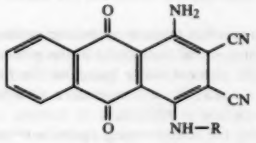
Filed Jul. 24, 1980, Ser. No. 171,870

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931981; Feb. 1, 1980, 3003657

Int. Cl.³ C07C *97/12*

U.S. Cl. 260—378 **10 Claims**

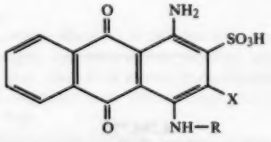
1. Process for the preparation of 2,3-dicyanoanthraquinones of the formula



wherein

R denotes hydrogen, optionally substituted alkyl or optionally substituted cycloalkyl,

by reacting sulphonic acids of the formula



or salts thereof,

wherein

R has the abovementioned meaning and

X denotes hydrogen or the sulphonic acid group, with compounds which donate cyanide ions, characterised in that the reaction is carried out in formamide or N-methyl-formamide.

4,294,770

PROCESS FOR PREPARING A NORMAL LONG CHAIN ALKANOIC ACID

Hitoshi Takita; Yutaka Mukaida, both of Tokyo, and Satoru Enomoto, Fujisawa, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1980, Ser. No. 121,875

Claims priority, application Japan, Feb. 22, 1979, 54-19998

Int. Cl.³ C11C *1/00*

U.S. Cl. 260—413 **4 Claims**

1. A process for preparing a normal alkanoic acid of 26 to 36 carbon atoms comprising the steps of heating a mixture of 1,1,1-trihalogeno-normalalkane of 26 to 36 carbon atoms dissolved in an organic solvent which is not completely miscible with water and an aqueous alkali solution to a temperature of 40° to 100° C. while stirring said mixture, thereby hydrolyzing

said 1,1,1-trihalogeno-normalalkane into an alkali normalalkanoate, and neutralizing said alkali normalalkanoate, thereby obtaining said normal alkanoic acid of 26 to 36 carbon atoms.

4,294,771

METHOD FOR THE PRODUCTION OF METAL SOAPS

Norbert Pietralla, Weidenstrasse 33, 8034 Unterpfaffenhofen; Valentin Ausserbauer, Zugspitzweg 29, 8015 Markt Schwaben, and Christian Rosenthal, Bäckergasse 15, 8131 Berg, all of Fed. Rep. of Germany

Filed Mar. 27, 1980, Ser. No. 134,194

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913592

Int. Cl.³ C08H *17/36*

U.S. Cl. 260—413 **7 Claims**

1. In a process for producing granulate metal soap or metal soap mixture in which at least one aliphatic carboxylic acid having about 8 to 22 carbon atoms is reacted with at least one soap-forming metal compound selected from the group consisting of metal oxide, metal hydroxide and metal carbonate in the presence of water at elevated temperature to provide soap, and water is subsequently removed, the improvement which comprises:

(a) heating a reaction mixture containing carboxylic acid and soap-forming metal compound in the presence of from 1 to 5 weight percent water based on the total weight of carboxylic acid(s) to a temperature at which the soap-forming reaction is initiated;

(b) permitting the soap-forming reaction to proceed under built-up overpressure without further supply of external heat;

(c) reducing the built-up overpressure; and,

(d) removing water from the reaction mixture under reduced pressure to provide granulate metal soap or metal soap mixture.

4,294,772

OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

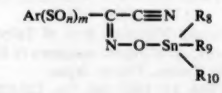
Filed Aug. 20, 1979, Ser. No. 68,262

Claims priority, application Switzerland, Aug. 31, 1978, 9200/78

Int. Cl.³ C07F *7/22*

U.S. Cl. 260—429.7 **5 Claims**

1. An oxime derivative of the formula



wherein

n is 0, 1 or 2,

m is 0 or 1,

Ar is alkylphenyl in which the alkyl group has from 1 to 4 carbon atoms, alkoxyphenyl in which the alkyl group has from 1 to 4 carbon atoms, halo-phenyl or naphthyl, and

R_8, R_9 and R_{10} are the same and are C_1–C_4 alkyl, benzyl or phenyl.

4,294,773

PREPARATION OF 1-HALOALKYL ISOCYANATES AND 1-ALKENYL ISOCYANATES

Karl-Heinz Koenig, Frankenthal; Karl-Heinz Feuerherd, and Heinz-Guenter Oeser, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

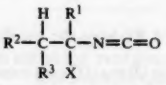
Filed Aug. 5, 1980, Ser. No. 175,591

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937006

Int. Cl.³ C07C *118/00, 119/042*

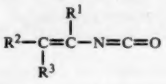
U.S. Cl. 260—453 P **10 Claims**

1. A process for the preparation of 1-haloalkyl isocyanates of the formula



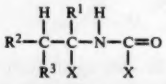
Ia

and 1-alkenyl isocyanates of the formula



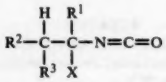
Ib

where R^1, R^2 and R^3 may be identical or different and each is hydrogen or methyl, and X is halogen, wherein a 1-haloalkyl-carbamic acid halide of the formula



II

or a 1-haloalkyl isocyanate of the formula



III

where R^1, R^2, R^3 and X have the above meanings, is reacted with α-pinene.

4,294,774

PREPARATION OF ORGANIC ISOCYANATES

Thomas R. Henson, and John F. Timberlake, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 14, 1980, Ser. No. 206,747

Int. Cl.³ C07C *118/00*

U.S. Cl. 260—453 P **5 Claims**

1. A process for the preparation of an organic isocyanate product comprising the step of preparing a heated solution of an alkyl carbamate in a solvent whereby the carbamate is catalytically decomposed into the corresponding organic isocyanate product and alkyl alcohol, said solvent being an N,N-dialkyl aniline compound which is characterized as being catalytic with respect to the decomposition rate of the carbamate but unreactive with respect to the organic isocyanate product.

4,294,775
RESOLUTION OF ACYLATED D,L-ALKYL SUBSTITUTED ALKANOIC ACIDS

Bonnie G. McKinnie, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

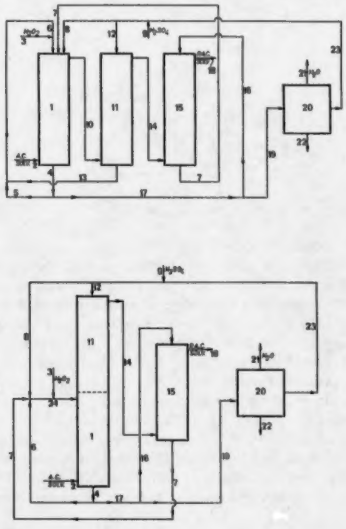
Filed Mar. 3, 1980, Ser. No. 126,678
Int. Cl.³ C07C *153/07, 153/09*
U.S. Cl. 260—455 R **12 Claims**

1. A process for resolving a racemic mixture of 3-benzoylthio- or 3-acetylthio-2-D,L-methylpropanoic acid comprising the steps of reacting said racemic mixture with an organoamine resolving agent in a solvent having an active oxygen selected from alcohols, ketones, esters and aldehydes suitable for the particular acid at a temperature sufficient to form the 3-benzoylthio- or 3-acetylthio-2-D,L-methylpropanoic acid organo-amine salt, cooling the resultant salt-containing solution at a rate sufficient to preferentially form crystalline solids containing a substantially enriched proportion of the 3-benzoylthio- or 3-acetylthio-2-D-methylpropanoic acid organoamine salt and separating said crystalline solids from the remaining salt-containing solution and recovering from the resultant crystalline solids said 3-benzoylthio- or 3-acetylthio-2-D-methylpropanoic acid.

4,294,776
PROCESS FOR THE PURIFICATION OF ORGANIC SOLUTIONS OF PERCARBOXYLIC ACIDS

Nicolas Hardy, and Georges Dancot, both of Jemeppe-sur-Sambre, Belgium, assignors to Propylox (Societe Anonyme), Brussels, Belgium

Filed May 1, 1980, Ser. No. 145,836
Claims priority, application France, May 4, 1979, 79 11234
Int. Cl.³ C07C *179/10*
U.S. Cl. 260—502 R **10 Claims**



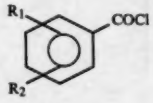
1. In a process for the purification of an organic solution of a percarboxylic acid in an inert organic solvent, the solution originating from the manufacture of a percarboxylic acid by reaction of the corresponding carboxylic acid or carboxylic anyhydride with hydrogen peroxide in the presence of a catalyst, under conditions sufficient to produce said percarboxylic acid, the improvement comprising subjecting the solution to be purified to a wash at a temperature of 263° to 303° K., by means of a dilute aqueous solution containing from 35 to 60% by weight of sulphuric acid.

4,294,777
COLOR-STABILIZED AROMATIC CARBOXYLIC ACID CHLORIDES AND A PROCESS FOR THEIR PREPARATION

Walter Böckmann; Karl-August Lipper, and Friedrich Brühne, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 17, 1979, Ser. No. 85,553
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848356
Int. Cl.³ C07C *51/64*
U.S. Cl. 260—544 D **15 Claims**

1. A process for color stabilizing an aromatic carboxylic acid chloride of the formula



wherein

R_1 and R_2 independently represent hydrogen and halogen, alkyl or alkoxy which comprises introducing into a composition containing said aromatic carboxylic acid chloride 0.001 to 2% by weight of a color stabilizer, based upon the amount of said carboxylic acid chloride, said color stabilizer being selected from the group consisting of

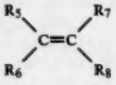
A. A stabilizer of the formula

wherein

R_3 and R_4 can be identical or different and represent hydrogen, halogen, hydroxy, alkoxy, aryloxy, aralkoxy, alkyl, aralkyl, aryl, alkenyl or mono- or di-alkylamino radicals;

R_3 and R_4 together with the carbonyl group can further form a ring;

B. A stabilizer of the formula

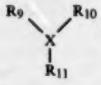


wherein

R_5 to R_8 are identical or different and represent hydrogen, nitrile, halogen, carboxyl, carbaryloxy, carbalkoxy, alkoxy, aryloxy, acyloxy, alkyl, aryl, aralkyl or alkenyl and

R_5 and R_6 and/or R_7 and R_8, or R_5 and R_7, and/or R_6 and R_8 together with the atoms to which they are linked, can further form a ring; and

C. A stabilizer of the formula



wherein

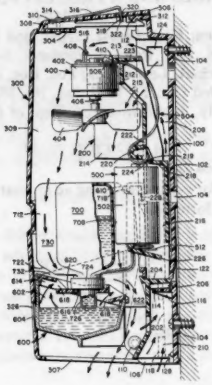
R_9 to R_{11} can be identical or different and represent alkyl, aryl, alkoxy, or aralkoxy and

X denotes phosphorus or arsenic.

4,294,778
EVAPORATIVE DISPENSER

Raymond F. DeLuca, Stamford, Conn., assignor to Georgia-Pacific Corporation, Portland, Oreg.

Filed Oct. 18, 1978, Ser. No. 952,386
Int. Cl.[3] A61L 9/04
U.S. Cl. 261—30 14 Claims



1. A dispenser for emitting a vaporized material into the ambient comprising:

a housing;

a reservoir disposed within said housing for containing a quantity of material to be vaporized;

inlet means for admitting air into said housing;

outlet means for exhausting air mixed with vaporized material from said housing;

air circulation means for effecting a flow of air through said housing from said inlet means to said outlet means;

a supply container for replenishing material evaporated from said reservoir and replaceable when empty with a full supply container;

means for removably supporting said supply container within said housing; and

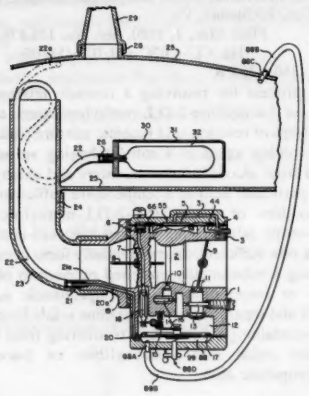
air channelling means carried by said supply container for channelling the air flowing through said housing across said reservoir, whereby said material is vaporized from said reservoir, entrained in said air flow and exhausted from said housing through said outlet means, said air channelling means comprising a protrusion formed on the exterior of said supply container which cooperates with said housing to define an airway for directing said air flow toward said reservoir.

4,294,779
CARBURETOR DEVICE

William J. Alape, Springfield, N.J., assignor to Aquascooter Inc., Springfield, N.J.

Filed Aug. 14, 1980, Ser. No. 178,061
Int. Cl.[3] F02M 17/04
U.S. Cl. 261—35 8 Claims

1. In a compensating membrane carburetor having a fuel accumulating chamber connected through idling and high-speed jets to a Venturi, the improvement which comprises: compensating chamber means maintained naturally or artificially at atmospheric pressure; second chamber means for sealing the external face of the compensating membrane from the environment of the carburetor; first relief means partially disposed in the carburetor providing fluid communication between the compensating chamber means and the second chamber means to maintain the second chamber means at atmospheric pressure; and second relief means disposed substantially outside of the carburetor for providing a second fluid

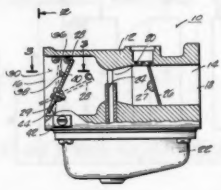


communication between the compensating chamber means and the second chamber means.

4,294,780
TEMPERATURE COMPENSATOR FOR A CARBURETOR CHOKE VALVE

Chester G. DuBois, Zion, and Richard P. Hulsebus, Waukegan, both of Ill., assignors to Outboard Marine Corporation

Filed Mar. 26, 1980, Ser. No. 134,065
Int. Cl.[3] F02M 1/10
U.S. Cl. 261—39 B 4 Claims



1. A carburetor comprising an air induction passage, a choke valve movable in said air induction passage between a first position and a range of positions spaced from said first position and including within said range of positions a second position of said choke valve, a pin movable between a first pin position extending into the path of choke valve movement for preventing movement of said choke valve from said choke valve second position toward said choke valve first position and a second pin position retracted from the path of choke valve movement for permitting movement of said choke valve between said choke valve first position and said range of choke valve positions, and thermostatic activation means operatively connected with said pin for controlling movement of said pin between said extended position and said retracted position.

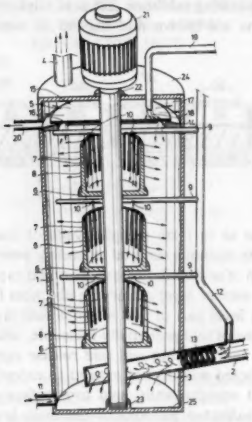
4,294,781
APPARATUS FOR WASHING GASES AND/OR RECOVERING HEAT THEREFROM

Börje G. A. Holmquist, Solna, Sweden, assignor to Leitex Stockholms-Tvatt Aktiebolag, Solna, Sweden

Filed Jan. 22, 1980, Ser. No. 114,381
Int. Cl.[3] B01D 47/16
U.S. Cl. 261—89 7 Claims

1. An apparatus for washing gases and/or recovering heat

therefrom, wherein said apparatus includes a cylindrical treatment vessel having at the bottom thereof a gas inlet connected to a gas supply line and at the top thereof a gas outlet for processed gas; a vertical rotatable centre shaft which carries at least one cup-shaped rotary body having a plurality of openings in the form of slots in the side wall thereof; respective means cooperating with said at least one rotary body for introducing liquid to at least one location within said at least one rotary body; and a liquid outlet at the bottom of the vessel; and said vessel also having an upper part defined by a ring-shaped



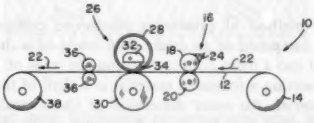
segment, arranged on the inside of said vessel, and a circular disc of porous material mounted on the shaft above said ring-shaped segment; a liquid inlet being directed onto the upper surface of the disc; and in which vessel the gas is arranged to flow past the at least one rotary body on the outside thereof in a space located between said at least one body and the wall of said vessel and substantially upwardly along said vessel wall and the outside of said rotary body; and in which vessel the liquid is arranged to be thrown out freely through the openings in the side wall of said at least one rotary body, out towards the wall of said vessel.

4,294,782

METHOD FOR SUBSTANTIALLY INSTANTANEOUS LIQUID MOLDING OF AN ARTICLE

Guy M. Froehlig, Glen Cove, N.Y., assignor to Jerome Bauer and Myron Amer, both of Mineola, N.Y.

Filed Apr. 10, 1979, Ser. No. 28,687
Int. Cl.³ B29D *11/00, 17/00*
U.S. Cl. 264—1.4 **8 Claims**



1. A method of producing an article by substantially instantaneous liquid molding comprising:

depositing a film of radiation-curable liquid material onto a support,

applying a radiation-transparent molding element to the film of liquid material to predeterminately configure the material by impressing it to the form of the article to be produced,

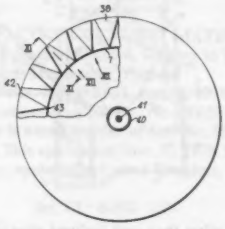
and irradiating the film of material with a source of radiation transmitted through the radiation-transparent molding element during said forming application of the molding element to the material so as to effect substantially instantaneous curing of the material and complete the production of the article in an essentially single-step molding and curing operation.

4,294,783

SPINNING PROCESS AND APPARATUS

Paul Snowden, Redcar, England, assignor to Imperial Chemical Industries, Inc., London, England

Filed Apr. 9, 1980, Ser. No. 138,547
Claims priority, application United Kingdom, Apr. 9, 1979, 12359/79; Mar. 3, 1980, 07084/80
Int. Cl.³ B29C *6/00*
U.S. Cl. 264—8 **3 Claims**



1. A process for the centrifugal spinning of fibres, utilizing the centrifugal spinning cup comprising a hollow cylinder with a plurality of discrete passages positioned around and extending through its circumferential wall from the interior cylindrical surface of the cup, the inlets to the passages being wider then the outlets and contiguous so that all the fibre-forming material flowing over the interior cylindrical surface from the supply region towards the inlets is directed, by the contiguous passage inlets, into the passages; said method comprising the steps of:

supplying a fibre-forming material in liquid form to the interior cylindrical surface at an area axially spaced from the passages so that the material must flow over a portion of the interior cylindrical surface before reaching the passages;

dividing all the fibre-forming material into a plurality of separate streams at the contiguous inlets of the passages, the fibre-forming material flowing into the passages;

rapidly spinning the cup; and

collecting formed fibres from the passages.

4,294,784

METHOD OF HAULING GRANULATES AND SIMILAR MATERIAL

Steinar J. Mailund, Kamomillegatan 9, 653 45 Karlstad, Sweden

Filed Mar. 28, 1979, Ser. No. 24,688
Claims priority, application Sweden, May 3, 1978, 7805088
Int. Cl.³ B01J *2/06*
U.S. Cl. 264—14 **6 Claims**

1. A method of producing metallic particles having improved drying efficiency, said method comprising:

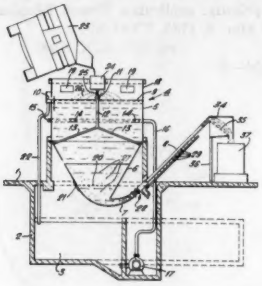
(a) providing a treatment vessel having a main portion and an inclined riser having a lower part, said treatment vessel including a curved transition section leading from said main portion to said inclined riser, said treatment vessel having a predetermined level of water therein;

(b) introducing individual molten droplets of a metal into said water in said main portion of said treatment vessel to quench said droplets and solidify same to form metallic particles;

(c) passing said metallic particles from said main portion through said curved transition section to said inclined riser;

(d) introducing compressed air into said lower part of said inclined riser to rapidly transport said metallic particles and a first portion of said water through said curved transition section and up said inclined riser, said metallic particles being formed so that upon solidification, they have an elevated temperature above the temperature of said water in said treatment vessel, at least a portion of said elevated temperature being retained by said metallic particles during passage through said treatment vessel and up said inclined riser;

(e) adjusting the level of said water in said treatment vessel



by means other than said inclined riser, to thereby maintain said predetermined level of water in said treatment vessel; and

(f) removing at least a part of said first portion of water from said metallic particles after rapid passage through said inclined riser, to recover metallic particles having improved drying efficiency, wherein after removal of part of said first portion of water said metallic particles still have an elevated temperature above the temperature of the water in said treatment vessel, thereby causing evaporation of residual water associated with said metallic particles.

4,294,785

PROCESS OF CASTING POLYPARABANIC ACID FILMS FROM STABILIZED ORGANIC AMIDE SOLVENTS

Tad L. Patton, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 967,660, Dec. 8, 1978, Pat. No. 4,208,486, which is a division of Ser. No. 797,842, May 17, 1977, Pat. No. 4,144,213. This application Dec. 12, 1979, Ser. No. 102,678

Int. Cl.³ B29D *27/00*; B32B *3/14*

U.S. Cl. 264—41 **8 Claims**

1. The method of casting polyparabanic acid films stabilized against degradation in the presence of amines, comprising preparing a solution of polyparabanic acid in a suitable solvent, said solvent containing a stabilizing amount of an aromatic sulfonic acid ester of an aliphatic, arylaliphatic or alicyclic alcohol or polyol, casting said solution of polyparabanic on a suitable surface, evaporating said solvent to obtain a polyparabanic acid film and drying said film.

4,294,786

SOLAR HEAT ENERGY COLLECTING SYSTEMS AND METHODS OF MAKING THE SAME

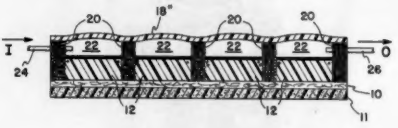
Alan A. Graham, Mercerville, N.J.; Laurence F. Haemer, Newton, Pa., and Charles H. Miller, Lawrenceville, N.J., assignors to Congoleum Corporation, Kearny, N.J.

Filed Apr. 2, 1979, Ser. No. 26,274

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—46.4 **8 Claims**

1. A method of making a solar heat energy collecting system which comprises: forming a potentially foamable, resinous base layer containing a blowing agent; applying a printing composition to the surface of said potentially foamable, resinous base layer in the form of at least one continuous path extending from one edge point to another edge point of said potentially foamable, resinous base layer, said printing composition comprising a blowing inhibitor and a release agent; applying a top surface layer to the surface of said printed potentially foamable, resinous base layer which adheres thereto except in those areas containing said blowing inhibitor and said release agent; and heating said potentially foamable, resinous base layer to decompose or to activate said blowing agent in those portions of said potentially foamable, resinous base layer not lying under said blowing inhibitor and said release agent, whereby said portions are blown and expand to extend and stretch



upwardly so as to form upright walls of foamed, relatively lower density resinous material extending away from the main level portion of said resinous base layer and capable of supporting said top surface layer at varying distances from the surface of said main level part of said resinous base layer, while those other portions of said potentially foamable, resinous base layer lying under said blowing and said release agent remain relatively unaffected and do not expand to extend or stretch upwardly, said upright walls, said top surface layer, and said relatively unaffected portions of the main level part of said resinous base layer forming at least one continuous open channel extending from one edge point to another edge point of said resinous base layer.

4,294,787

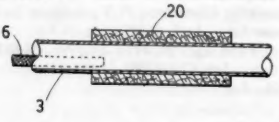
METHOD OF PRODUCING REINFORCED COMPOSITE RACKET FRAME

Kun-Nan Lo, No. 7-1, La. 246, Sec. 3, Chung-Shan Rd., Tan Tzu Hsiang, Taichung Hsien, Taiwan

Filed May 5, 1980, Ser. No. 146,593

Int. Cl.³ B29D *27/00*; A63B *49/10*

U.S. Cl. 264—46.6 **2 Claims**



1. A method of producing reinforced composite racket frames composed of an outer shell made of a thermosetting material and a foam core comprising the steps of:

(a) inserting a foamable material in a shell of thermosetting material, the outer dimension of the foamable material being less than the inner dimension of the shell so as to create a space between said shell and said foamable material;

(b) inserting the shell and the foamable into a mold;

(c) initially pressurizing the space with pressurized gas to force the shell to intimately contact the inner surface of the mold; and

(d) after the initial pressurizing step, heating the mold to a temperature at which the foamable material expands to subsequently fill said space and to pressurize said space by said foamable material.

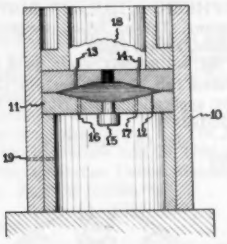
4,294,788
METHOD OF MAKING A SHAPED SILICON CARBIDE-SILICON MATRIX COMPOSITE AND ARTICLES MADE THEREBY

William Laskow, Downingtown, Pa., and Charles R. Morelock, Ballston Spa, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 100,579, Dec. 5, 1979, Pat. No. 4,240,835, which is a continuation-in-part of Ser. No. 946,718, Sep. 28, 1978, abandoned, which is a division of Ser. No. 572,969, Apr. 30, 1975, Pat. No. 4,141,948, which is a continuation-in-part of Ser. No. 354,106, Apr. 24, 1973, abandoned. This application Mar. 21, 1980, Ser. No. 131,941

Int. Cl.³ C04B *34/70*

U.S. Cl. 264—101 **8 Claims**



1. A method for making a silicon carbide-silicon matrix ceramic of the desired shape which comprises:

(a) infiltrating molten silicon at a temperature of from 1400° C. to 1800° C. into a shaped carbon fiber part which further includes silicon carbide crystals dispersed therein while said part is substantially contained in a mold in a non-oxidizing atmosphere and under reduced pressure, and

(b) separating the resulting silicon carbide ceramic from the mold where the fiber used in (a) has a specific gravity of from about 1.3 to 1.5.

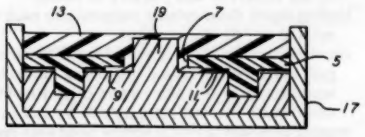
4,294,789
PLATING MASK FABRICATING PROCESS

Howard P. Lincoln, N. Warren, and Donald M. Reddinger, Russell, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 8, 1980, Ser. No. 185,093

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—102 **10 Claims**



1. A plating mask fabricating process comprising the steps of:

forming and positioning a mask blank within a mold member, said mask blank having a relatively flat surface, a plurality of apertures each with an inner peripheral surface and a surface opposite to said relatively flat surface with a recessed portion surrounding each aperture on said surface opposite said relatively flat surface, said inner peripheral surface of said apertures of said mask blank being spaced from said mold member;

depositing polyurethane in said mold member to provide a layer thereof on said relatively flat surface, said inner peripheral surface of said apertures and said recessed portion of said surface opposite said relatively flat surface;

curing said deposited polyurethane in said mold member to provide a mask blank having polyurethane affixed to said relatively flat surface, said inner peripheral surface of said apertures and said recessed portion of said surface opposite said relatively flat surface;

treating said polyurethane in said mold member to provide said polyurethane on said flat surface of said mask blank with a substantially flat surface suitable for sealing to a metal; and

removing said mask blank and affixed polyurethane from said mold member to provide an apertured mask having a polyurethane surface suitable for selective plating of specified areas of a metal.

4,294,790
MANUFACTURE OF SHEET MATERIAL

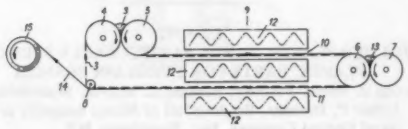
Harry Thornley, Rochdale, England, assignor to TBA Industrial Products Limited, Manchester, England

Continuation of Ser. No. 892,512, Apr. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 892,513, Apr. 3, 1978, abandoned, which is a continuation of Ser. No. 657,477, Feb. 12, 1976, abandoned. This application Nov. 27, 1979, Ser. No. 97,887

Claims priority, application United Kingdom, Feb. 13, 1975, 6160/75

Int. Cl.³ B29D *7/14*

U.S. Cl. 264—171 **8 Claims**



1. A process for the production of fiber-reinforced sheet material of indefinite length, which comprises the steps of:

(a) providing an uncured, heat-curable dough compounded from thermoplastic polymer, reinforcing fiber and a solvent system which comprises a liquid solvent for the polymer and a liquid which is a non-solvent for the polymer, the non-solvent imparting release characteristics to the dough;

(b) rolling the dough of step (a) onto one face of a metal band, at ambient temperature and under a rolling pressure in the order of 10 kg per cm sufficient to form an uncured first coating of dough having a thickness in the order of 0.5 mm and which is wholly exposed on that side face thereof remote from said one face of the band;

(c) heating said first coating while exposed as in step (b) under conditions of time and temperature sufficient to dry said first coating but insufficient significantly to cure same, whereby the flow characteristics of the first coating are not drastically altered;

(d) rolling the dough of step (a) onto said first coating on said one face of the band, at ambient temperature and under a rolling pressure sufficient to form, with said first coating, a single uncured layer of thickness increased with respect to that of said first coating and which is wholly exposed on that side face thereof remote from said one face of the band;

(e) heating said single layer while exposed as in step (d) under conditions of time and temperature sufficient to dry said single layer but insufficient significantly to cure same, whereby the flow characteristics of the single layer are not drastically altered;

(f) stripping said single layer from said band; and

(g) heating said stripped layer under conditions of time and temperature sufficient to cure the dough and drastically alter the flow characteristics thereof.

4,294,791

PROCESS FOR PRODUCING THERMOPLASTIC RESIN FILM OF MARKEDLY REDUCED THICKNESS UNEVENNESS

Hiroshi Nouda, Sagamihara; Yoshiaki Tanihara, Machida; Takashi Ikeda, and Ituo Ogiuchi, both of Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Dec. 26, 1979, Ser. No. 107,280

Claims priority, application Japan, Jan. 5, 1979, 54/22; Jan. 5, 1979, 54/23; Jan. 5, 1979, 54/24

Int. Cl.³ B29D *7/24*

U.S. Cl. 264—210.2 **4 Claims**

1. In a process for producing a film of a thermoplastic resin which comprises extruding a molten thermoplastic resin in film form onto a rotating cooling drum through a die slit, cooling the film-like extrudate on the cooling drum, withdrawing the cooled film-like extrudate from the cooling drum, and then stretching it, the improvement wherein the rotation of the cooling drum is controlled such that the variation rate (%) of instantaneous rotation under no load defined by the following

$$\frac{\text{(Maximum instantaneous rotating speed)} - \text{(Minimum instantaneous rotating speed)}}{\text{Average rotating speed}} \times 100$$

is less than about 1%, and wherein said withdrawal of the cooled film-like extrudate is carried out so that substantially no tension in the subsequent stretching step is exerted on the film-like extrudate on the cooling drum.

4,294,792

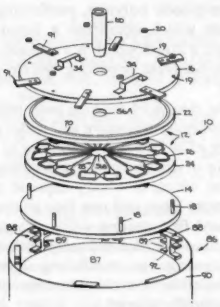
MOLDED PLASTIC PARTS, PARTICULARLY SPIN-CAST PLASTIC PARTS FOR EYEGLASS FRAMES

Irving J. Arons, Peabody; Richard E. Merrill, Wakefield, and Arthur P. Drennan, Brighton, all of Mass., assignors to Universal Optical Company, Inc., Providence, R.I.

Filed Oct. 27, 1978, Ser. No. 955,149

Int. Cl.³ B29C *5/04*

U.S. Cl. 264—311 **13 Claims**



1. A spin casting process for producing a solid, substantially clear, low color thermoset plastic part which has a cross-linked structure when cured, particularly an eyeglass part, in a flexible mold from a curable liquid resin system, the flexible mold including separable mold portions at least one of which is flexible and which define at least one mold cavity when the mold portions are assembled to form the flexible mold, means being provided for rigidly holding the mold portions together as a rigid, transportable mold assembly, said process comprising the steps of:

assembling the mold portions to form the flexible mold;

introducing the liquid resin system comprising an epoxy resin and a curing agent therefor which are substantially clear and of low color into the flexible mold;

rotating the flexible mold in the rigid mold assembly in or on spinning apparatus until the liquid resin system is distributed in the mold cavity but is still soft and uncured and is yet not self-supporting;

removing the rigid mold assembly including the flexible mold as a rigid unit from the spinning apparatus while the liquid resin system therein is still soft and uncured and is yet not self-supporting;

hardening the liquid resin system while in the rigid mold assembly after removal of the rigid mold assembly from the spinning apparatus to form the part; and

thereafter disassembling the rigid mold assembly and removing the part.

4,294,793

METHOD AND APPARATUS FOR MANUFACTURING A SPHERICAL HOLLOW BODY

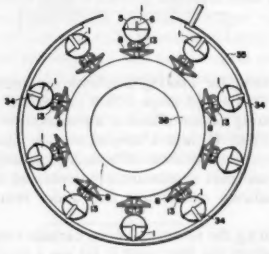
Kazuyasu Takazawa, Tokyo, Japan, assignor to Tachikara Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 894,007, Apr. 6, 1978, abandoned. This application Feb. 27, 1980, Ser. No. 125,389

Claims priority, application Japan, Nov. 15, 1977, 52-136813; Nov. 30, 1977, 52-143379

Int. Cl.³ B29C *5/04*

U.S. Cl. 264—311 **8 Claims**



1. A method for manufacturing a spherical hollow body, comprising the steps of:

providing a plurality of individual openable spherical hollow molds each defining therein a single spherical mold cavity disposed so that its center is located substantially at the intersection of first and second orthogonal rotational axes;

mounting said molds in horizontally angularly spaced relationship on a supporting turntable rotatable about a vertical axis positioned at the center of a circular locus defined by the centers of said plurality of molds;

loading liquid thermoplastic material into each said hollow mold at an operator position;

circulating said hollow molds along a horizontal circular path by movement of said supporting turntable about said vertical axis so that the centers of said molds are maintained in a horizontal plane defined by said circular locus;

rotating each said spherical hollow mold with respect to said turntable about said first axis by clutching a rotating drive member to said spherical hollow mold through a clutch having driving and driven clutch members to effect said rotating;

simultaneously rotating each said spherical hollow mold with respect to said turntable about said second axis whenever the respective mold is rotated about said first axis by rotatably driving the mold through a clutch-free driving mechanism which is continuously driven whenever said driven clutch member is rotatably driven;

forcibly effecting said circulating of the turntable during said rotation of the molds;

discharging cooling water over the molds for effecting hardening of the thermoplastic material to provide a hardened

spherical body while continuing to rotate said molds simultaneously about said first and second orthogonal axes;

circulating a declutching member with said turntable for each said hollow spherical mold and connecting said declutching member to said clutch of the respective hollow spherical mold;

locating an elongated guide plate in fixed relation to said operator position adjacent said turntable;

riding the follower along the guide plate contoured to move the following transversely thereof to effect declutching and clutching of each said mold from the corresponding said drive member by contact of said guide plate and follower moving said declutching member with respect to said turntable as said turntable circulates each said mold respectively into and out of said operator position.

4,294,794

ETHYLENE POLYMERS OF HIGH MELT INDEX

Peter J. Lovell, Kingston, and Ian C. B. Saunders, Sarnia, both of Canada, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 77,717, Sep. 21, 1979, abandoned, which is a division of Ser. No. 170, Jan. 2, 1979, Pat. No. 4,192,935. This application Aug. 20, 1980, Ser. No. 179,811

Claims priority, application United Kingdom, Jan. 6, 1978, 000517/78; Mar. 21, 1978, 011206/78

Int. Cl.³ B29F *1/00*

U.S. Cl. 264—328.1 **7 Claims**

1. In a process for the manufacture of containers having a wall thickness of less than 0.7 mm, said containers being manufactured from thermoplastic polymer by injection-moulding said polymer, the improvement comprising using as the thermoplastic polymer an ethylene polymer having a density in the range of about 0.940–0.960, a melt index in the range 100–200 and a ratio of weight-average molecular weight to number-average molecular weight of less than 5, said polymer being a copolymer of ethylene and at least one α-olefin having 4–10 carbon atoms, the α-olefin being an aliphatic hydrocarbon.

4,294,795

STABILIZED ELECTROCAST ZIRCONIA REFRACTORIES

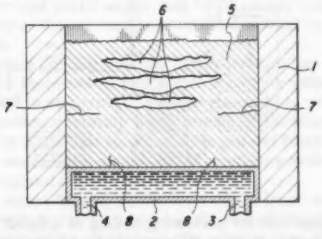
Toshikatsu Haga; Hiroyuki Fukuda, both of Iwaki; Hiroshi Shinoda, Gifu, and Hideharu Hayakawa, Nagoya, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and NGK Insulators, Ltd., Aichi, both of, Japan

Continuation-in-part of Ser. No. 45,687, Jun. 5, 1979, abandoned. This application Jan. 29, 1980, Ser. No. 116,409

Claims priority, application Japan, Jun. 12, 1978, 53-70529; Jun. 27, 1978, 53-77837

Int. Cl.³ C04B *35/48*

U.S. Cl. 264—332 **12 Claims**



1. A method for producing a stabilized electrocast zirconia refractory having a bending strength of over 500 kg/cm² at room temperature and containing less than 1% each of TiO_2, Al_2O_3 and SiO_2, which comprises the steps of:

blending a zirconia base material and a stabilizing agent selected from the group consisting of alkaline earth metal compounds and rare earth compounds,

electrofusing the thus formed mixture thereby obtaining a stabilized molten zirconia blend,

pouring said stabilized molten zirconia blend into a mold,

letting said melt solidify from its lower portion by cooling forcibly the bottom of the mold, and

cutting out the portion of the solidified mass where voids were formed,

thus obtaining said stabilized electrocast zirconia refractory.

4,294,796

EXTRUSION PROCESSES AND APPARATUS FOR QUENCHING TUBES

James Jack, Mistley, and Derek C. Gray, Colchester, both of England, assignors to BXL Plastics Limited, London, England

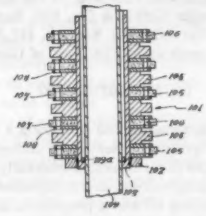
Continuation of Ser. No. 903,914, May 8, 1978, abandoned, which is a continuation of Ser. No. 514,801, Oct. 15, 1974, abandoned. This application Jan. 22, 1979, Ser. No. 5,231

The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.

Claims priority, application United Kingdom, Oct. 15, 1973, 48047/73

Int. Cl.³ B29D *7/20*

U.S. Cl. 264—559 **13 Claims**



1. In an apparatus for use in the production of a quenched tube of organic thermoplastic polymeric material comprising a downwardly operating extrusion die, a quenching bath, an assembly of calibrating discs which are disposed perpendicularly to the axis of the tube and which are mutually coaxial with each other as well as with the axis of the tube and which assembly is supported by a tubular structure attached to and passing through the mandrel of the extrusion die, means for passing quenching liquid continuously through the tubular structure into contact with the inner surface of the tube at a level below that of the lowermost of the calibrating discs, suction means for continuously drawing the same liquid upwardly as a continuous column within said tube to a selected level above the uppermost level of the assembly of calibrating discs and for removing said liquid upwardly from said selected level, means for controlling a gas pressure in the space enclosed by the die, the thermoplastics tube and the surface of the quenching liquid, a pair of nip rollers which flatten the tube across only part of its width and which enable the direction of travel of the tube to be changed from a vertically downward direction to an upward direction of travel in the quenching bath and means for taking the tube from the quenching bath to a point where it is batched or is subjected to additional treatment, the improvement whereby at least the peripheral portions of all of the calibrating discs that in operation contact the wall of the tube comprise a soft, liquid absorbent material.

8. In a process for quenching a continuously extruded tube of organic thermoplastic polymeric material which comprises the steps of leading the tube from the die of an extrusion machine vertically downward around an assembly of a plurality of calibrating discs which are positioned coaxially of said tube and perpendicular to the axis thereof into a quenching bath, while bathing the inner surface of said tube with a quenching liquid which is circulated through said tube by first forming a body of liquid in contact with said inner surface beneath said

assembly, causing the liquid in said body to rise in a continuous column within said tube to a selected level lying above the top of said assembly while remaining in contact with said inner surface between the discs of said assembly and at said selected level above said assembly, and withdrawing said liquid upwardly from a point above said assembly by suction means which maintains said liquid at said selected level, causing said tube to change its direction of travel from a vertically downward direction to an upward direction of travel in the quenching bath after it has passed through a pair of nip-rollers which flatten the tube across only part of its width, and withdrawing the tube from the quenching bath, the improvement which comprises the step of forming a lubricating layer of quenching liquid between the periphery of each disc and the wall of the tube by causing said liquid to saturate at least peripheral portions of the calibrating discs that contact the wall of the tube, which portions are made of a soft, liquid absorbent material so that a lubricating layer of quenching liquid is continuously in contact with the inner surface of said tube from a point below to a point above said discs.

4,294,797

SERVICING COMPOSITION FOR SPRAYING ON MEDICAL INSTRUMENTS

Eugen Eibofner, Biberach, Fed. Rep. of Germany, assignor to Kaltenbach & Voight GmbH & Co., Fed. Rep. of Germany

Filed Apr. 18, 1980, Ser. No. 141,363

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916552

Int. Cl.[3] **A01N** *31/00*

U.S. Cl. 422—36 **1 Claim**

1. A method of lubricating and sterilizing a medical instrument comprising: spraying a servicing composition on said instrument so that the latter is wetted internally and externally with the servicing composition, said composition comprising a mixture of a lubricating oil and a propellant, and a sterilizing agent added to said mixture and comprising an isopropanol-aldehyde active substance combination in a proportion of 5 to 15% by weight of the servicing composition wherein the aldehyde is selected from the group consisting of formaldehyde and a succinic acid dialdehyde complex;

and heating the medical instrument, so as to increase the sterilizing effect of said active substance combination, until the active substance combination has vaporized.

4,294,798

SODIUM AMALGAM MONITOR

Italo A. Capuano; Patricia A. Turley, both of Orange, and Edward W. DuBord, Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 31, 1979, Ser. No. 44,295

Int. Cl.[3] **G01N** *21/00, 31/12*

U.S. Cl. 422—62 **10 Claims**

1. An apparatus for automatically monitoring sodium concentration in a sodium-mercury amalgam, which comprises:

(a) a reactor;

(b) sample supply means positioned above said reactor, fluidly connecting said reactor with said sodium amalgam for automatically supplying a selected sample of said sodium-mercury amalgam to said reactor;

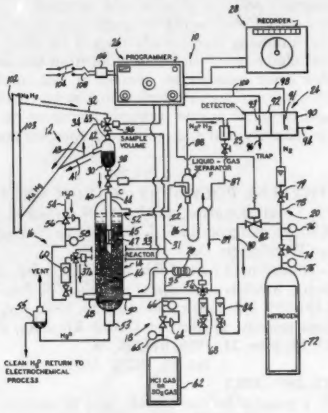
(c) acid supply means containing acid connected to the lower end of said reactor for automatically supplying a sufficient quantity of acid to said reactor to completely react with and remove any metallic sodium from said sample and producing a quantity of hydrogen gas proportional to the amount of sodium in said sample;

(d) a liquid-gas separator located at the upper end of said reactor in fluid communication with said reaction chamber, for separating liquid and gaseous reaction products produced by said reaction of said mineral acid with said sample;

(e) inert gas supply means containing inert gas connected to the lower end of said reactor in selective communication with said reaction chamber, for automatically forcing said gaseous reaction products out of said reactor and into said liquid-gas separator;

(f) a reactor outlet for mercury removal located at the bottom of said reactor;

(g) detector means for determining the amount of hydrogen in the gas fraction from said liquid-gas separator and



producing a signal which is indicative of said amount of hydrogen;

(h) a programmer means for controlling the order of operation of said sample supply means, mineral acid supply means and inert gas supply means; and

(i) display means, for providing a visual indication of the amount of said quantity of hydrogen in terms of percent sodium concentration in said sample.

4,294,799

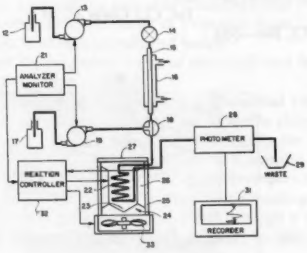
TEMPERATURE REGULATING APPARATUS

Donald E. Stephens, Palo Alto, and John T. Taylor, Santa Clara, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 24, 1980, Ser. No. 143,212

Int. Cl.[3] **G01N** *31/22, 31/08;* **G01J** *3/46*

U.S. Cl. 422—62 **13 Claims**



1. An apparatus for preventing boiling of a liquid flowing through a heated reaction chamber of a liquid chromatograph instrument due to a change in the boiling point of said liquid, said apparatus comprising:

said heated reaction chamber;

means, adjacent said reaction chamber, for exchanging heat to and from said reaction chamber;

means, associated with said flowing liquid, for monitoring a change in the ratio of reactants in said flowing liquid, said

change in the ratio of reactants resulting in a change in the boiling point of said flowing liquid;

means, defining a substantially enclosed space containing said reaction chamber and said heat exchanging means, for retaining heat;

means, responsive to said monitoring means, for introducing a coolant into said substantially enclosed space in response to a change in said boiling point; and

means defining an exit for said coolant from said enclosed space.

4,294,800

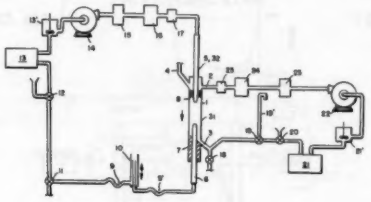
LIQUID JET RECYCLE REACTOR

Lawrence L. Tavlarides, 940 Sheridan Rd., Wilmette, Ill. 60091; Robert W. Freeman, 1539 S. Wolf Rd., Wheeling, Ill. 60090, and Alexander M. Hsia, c/o Illinois Intitute of Technology, 71 E. 32nd St. - Room 110, Chicago, Ill. 60616

Filed Oct. 30, 1978, Ser. No. 955,581

Int. Cl.³ G01N *21/00*; B01J *14/00*

U.S. Cl. 422—68 **7 Claims**



1. A liquid-liquid jet reactor apparatus in which, for the investigation of interphase phenomena two immiscible or partially miscible liquids, one being represented by an aqueous phase and the other by an organic phase, are brought into mutual contact, said reactor apparatus comprising:

a nozzle means for producing a vertical jet of the first liquid,

a receiver means longitudinally spaced from and axially aligned with said nozzle means for collecting said jet, said receiver means having an inner surface and an outer surface,

a tubular vessel coaxial with said nozzle means and said receiver means,

the inner wall of said tubular vessel being radially spaced from said nozzle means and said receiver means so that said tubular vessel closely surrounds said nozzle means and said receiver means in sleevelike fashion, and said tubular vessel extending both upstream of the inner end of said nozzle means and downstream of the inner end of said receiver means so as to define a narrow annular gap between said nozzle means, said liquid jet and said receiver means on the one hand and said tubular vessel on the other hand,

feed means opening into said narrow annular gap upstream of the inner end of said nozzle means for admitting the second liquid into said annular gap so as to produce, in operation, a separate steady stream of the second liquid which is confined to said annular gap and flows coaxially and cocurrently about, and in contiguity with, said jet throughout the length thereof,

outlet means located downstream of the inner end of said receiver means for removing the second liquid from the corresponding portion of the annular gap, and baffle means between said nozzle means and said vessel for directing the stream of said second liquid, one of said surfaces of said receiver means, which serves to conduct said organic phase, having a coating of hydrophobic material deposited thereon so as to be less readily wetted by said aqueous phase than by said organic phase thereby to facilitate separation of said two streams.

4,294,801

GAS COMPONENT DETECTOR

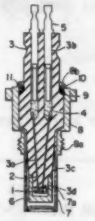
Yoshihiro Segawa, Okazaki; Minoru Ohta, Anjo, and Eturo Yasuda, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 20,927, Mar. 15, 1979, abandoned. This application Jul. 15, 1980, Ser. No. 169,162

Claims priority, application Japan, Mar. 24, 1978, 53/38196

Int. Cl.³ G01N *27/04*

U.S. Cl. 422—98 **4 Claims**



1. A gas component detector comprising:

a detector element of a metal oxide, said metal oxide exhibiting an electrical resistance value change depending upon a gas component in detected gases,

a pair of electrodes connected to said detector element for picking up an electrical signal indicative of said electrical resistance value change,

a holding body of an electrically insulating and heat-resistant metal oxide having a pair of through holes for supporting said pair of electrodes inserted therein,

a cup-shaped catalyst carrier body of a heat-resistant metal oxide having a well, said catalyst carrier body being fixed to one end of said holding body to enclose said detector element within said well, said catalyst carrier body being so porous as to allow the exhaust gases to be detected to pass therethrough,

a catalyst material carried by said catalyst carrier body for effecting oxidating reaction of said gas component in the detected gases,

said cup-shaped catalyst carrier body having an internal surface of the well being spaced from the metal oxide of said detector element by an air gap with the catalyst thereon, which catalyst is not contacting the metal oxide,

a cover of heat resistant metal enclosing said cup shaped catalyst carrier body, said cover having opening means provided therethrough for exposing the cup shaped catalyst carrier body to the exhaust gas.

4,294,802

APPARATUS FOR PARALLEL FEEDING OF SMALL VOLUMES OF FLUIDS IN SEVERAL ESSENTIALLY PARALLEL FLEXIBLE HOSES

Henry Johansson, Törevägen 28, S-741 00 Knivsta, Sweden

Filed Feb. 14, 1980, Ser. No. 121,534

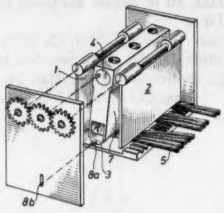
Claims priority, application Sweden, Feb. 27, 1979, 7901775

Int. Cl.³ G01N *1/14*

U.S. Cl. 422—103 **12 Claims**

1. Apparatus for parallel feeding of small volumes of liquids in essentially parallel flexible hoses comprising a surface over which said hoses extend during operation of said apparatus, a pumping bar extending substantially perpendicular to said surface, at least one hose clamp extending substantially perpendicular to said surface, an eccentric coupled to said pumping bar, a shaft coupled to said hose clamp, a support coupled to said eccentric and said shaft, and means coupled to said eccentric and said shaft for causing said eccentric and shaft to synchronously rotate causing said pumping bar to reciprocate in a pendulum motion towards and away from said surface for

subjecting said hoses to a pumping action and said hose clamp to reciprocate towards and away from said surface for clamping said hoses together at predetermined times during the pumping cycle.



4,294,803

APPARATUS FOR PREVENTING COKING IN FLUIDIZED BED REACTOR FOR CRACKING HEAVY HYDROCARBON OIL

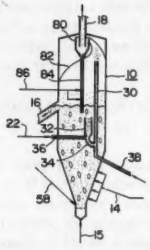
Seiichi Uchida, Urawa; Yoshihito Satomi, Kurashiki; Norihiro Kiuchi, Hachioji; Takeo Yamagata, Takahagi; Susumu Yoshioka, Hitachi; Tomohiko Miyamoto, Takahagi, and Jinichi Tomuro, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Nippon Mining Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 946,426, Sep. 27, 1978, Pat. No. 4,220,518. This application Aug. 21, 1979, Ser. No. 68,452

Claims priority, application Japan, Sep. 28, 1977, 52-115538; Sep. 28, 1977, 52-115539; Nov. 7, 1977, 52-132478

Int. Cl.[3] G05D *16/00, 7/00;* **F27B** *15/08*

U.S. Cl. 422—111 **10 Claims**



1. In an apparatus, for cracking heavy hydrocarbon oil through a fluidized bed, comprising a reactor column of fluidized bed type for cracking heavy hydrocarbon oil through contact with fluidization particles, provided with a means for supplying a fluidization gas at its lower part and an outlet port for discharging a cracked effluent gas at its top, and a regenerator column of fluidized bed type for regenerating the fluidization particles, the reactor column provided with a means for supplying a fluidized gas at its lower part and an outlet port for gas at its top, and the reactor column and the regenerator column communicating with each other,

an apparatus which comprises: a fluidization particle vessel having an inlet for fluidization particles at its top, and a lower part throttled to a smaller cross-sectional area than the top; a lift gas supply line means moving a stream of lift gas through said lift gas supply line and communicating with the bottom of the particle vessel to receive fluidization particles at a controlled rate determined by the throttled part into said lift gas supply line and entrain them in the lift gas moving in said lift gas supply line; said lift gas supply line having one end open towards one of the outlet ports for discharging the entrained fluidization particles and lift gas above the associated fluidized bed; a control gas supply line means conducting control gas into the throttled lower part of the particle vessel; and means selectively controlling the control gas conducted through said control gas supply line into said throttled lower part to correspondingly control the movement of the fluidization particles from the particle vessel to the lift gas supply line.

4,294,804

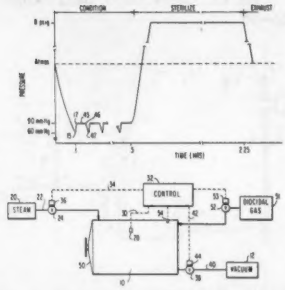
PRESSURE RESPONSIVE CONDITIONING CONTROL GAS STERILIZATION

Walter J. Baran, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 9,818, Feb. 6, 1979, Pat. No. 4,241,010. This application Jun. 25, 1980, Ser. No. 162,812

Int. Cl.[3] A61L *2/20, 2/24*

U.S. Cl. 422—112 **3 Claims**



1. Apparatus for conditioning goods for sterilization and sterilizing goods with a chemically biocidal gas, the conditioning including heating the goods to a selected temperature related to the desired sterilization temperature and moistening the goods to a desired level for such biocidal gas sterilization, with conditioning steps being free of temperature and moisture measurement requirement levels in the goods and chamber, comprising in combination

a sealable chamber capable of operating at pressures other than atmospheric,

means providing access for loading goods to be sterilized into the chamber and closing the chamber to permit operation at other than atmospheric pressure,

means for evacuating the chamber,

means for sensing pressure levels in the chamber,

means for injecting a conditioning vapor comprising steam into the chamber,

valve means for controlling injection of conditioning vapor into the chamber, said valve means being free of flow rate control adjustment capabilities,

means for introducing a chemically biocidal gas, and

control means electrically interconnected to activate and deactivate the means for evacuating the chamber, the valve means for controlling injection of conditioning vapor, and the means for introducing a biocidal gas,

such control means being electrically connected to the means for sensing pressure level within the chamber and including timer means and sequencing means to evacuate the chamber to a preselected subatmospheric level responsive to such pressure level sensing means, then

inject conditioning vapor to raise chamber pressure to a higher preselected subatmospheric pressure level responsive to such pressure level sensing means, then

hold the chamber in sealed condition with evacuation and vapor injection interrupted for a predetermined time responsive to the timer means, then

repeat such sequence of evacuating the chamber, injecting

conditioning vapor, and holding the chamber in sealed condition, then

add biocidal gas to raise chamber pressure to a desired pressure above atmospheric pressure responsive to such pressure sensing means, and

hold such biocidal gas and conditioning vapor in the chamber a predetermined time responsive to the timer means to complete desired sterilization.

4,294,805

METHOD OF LEACHING THE CONTENTS OF A CAN

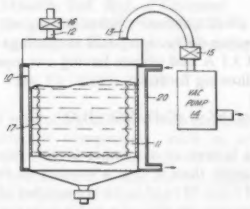
Thomas D. Hodgson, and Tony W. J. Jordan, both of Abingdon, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 8, 1979, Ser. No. 64,911

Claims priority, application United Kingdom, Aug. 9, 1978, 32747/78

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—4 **7 Claims**



1. A method of leaching material from a composite body with a liquid dissolvent which evolves a gas on contacting the material, the composite body comprising the material to be leached located in a tubular can, said can being insoluble in the dissolvent and open at one end thereof to expose said material, the method comprising placing the body in a vessel containing a said liquid dissolvent for the material and heating the vessel to a temperature near to the boiling point of the dissolvent, and then subjecting the vessel to a plurality of pressure cycles, each pressure cycle comprising, firstly, reducing the pressure inside the vessel using a vacuum source connected to the vessel so as to cause boiling of the dissolvent, and subsequently, introducing a gas into the vessel through a vent means of the vessel so as to increase the pressure inside the vessel from the reduced pressure therein to inhibit the boiling of the dissolvent, thereby to displace from partially enclosed cavities in said body during the reduced pressure portions of the cycles evolved gas entrapped in said cavities.

7. A method of leaching irradiated nuclear material and fission products from at least one length cut from an irradiated nuclear fuel element said fuel element comprising said nuclear material clad with a metal can, the method comprising placing the cut length of the fuel element into a vessel containing nitric acid and heating the vessel near to the boiling point of the nitric acid, and subjecting the vessel to a plurality of pressure cycles, each pressure cycle comprising, firstly, reducing the pressure inside the vessel using a vacuum source connected to the vessel so as to cause boiling of the nitric acid, and subsequently, introducing a gas into the vessel through a vent means of the vessel so as to increase the pressure inside the vessel from the reduced pressure therein to inhibit the boiling of the nitric acid, thereby to displace from partially enclosed cavities in the cut length during the reduced pressure portions of the cycles gas evolved from contact of the nitric acid with the nuclear material.

4,294,806

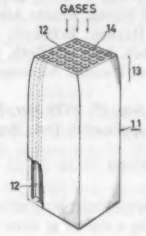
METHOD FOR PREVENTING THE WEAR OF A MONOLITHIC CATALYST BY DUSTS

Kazunobu Abe, Izumi; Shoichi Tamura, Sakai, and Tadao Nakatsuji, Matsubara, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 12,196, Feb. 14, 1979, abandoned, which is a continuation-in-part of Ser. No. 974,519, Dec. 29, 1978, abandoned. This application Nov. 21, 1979, Ser. No. 96,561

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—239 **12 Claims**



1. In a method for the catalytic reduction of nitrogen oxides contained in waste gases together with dusts therein in the presence of ammonia as a reducing agent so as to convert said nitrogen oxides to nitrogen and water by use of a monolithic ceramic honeycomb catalyst having at least one passage therethrough parallel to the direction of flow of gas for allowing the gas to pass therethrough and comprising a support of at least one member selected from the group consisting of alumina and titanium dioxide and a catalytically active ingredient uniformly dispersed in the support, the ingredient being of at least one oxide of a base metal selected from the group consisting of Cu, Ni, Co, V and W, the improvement in which the support and the active ingredient are not sintered but calcined throughout the structure so as to be substantially porous throughout the structure but wherein the honeycomb catalyst is sintered only at its front inlet so as to render it substantially non-porous, thereby making the honeycomb catalyst more wear-resistant as a whole.

4,294,807

SYSTEM FOR REMOVING SOLIDS FROM A USED LIME OR LIMESTONE SLURRY SCRUBBING LIQUOR IN FLUE GAS DESULFURIZATION

Alan D. Randolph, Tuscon, Ariz., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif. and The Arizona Board of Regents, The University of Arizona, Tucson, Ariz.

Filed Nov. 10, 1980, Ser. No. 205,702

Int. Cl.³ B01D *9/02*

U.S. Cl. 423—242 **11 Claims**

1. In a flue gas desulfurization process using a lime or limestone slurry scrubbing liquor in which used liquor including crystallizable solids comprising calcium sulfite or sulfate, in hydrated or unhydrated form, is produced, wherein precipitated particles are removed from the used scrubbing liquor, the steps of

(a) feeding the used scrubbing liquor to an agitated crystallization zone and agitating the liquor therein, thereby growing crystals from said crystallizable solids,

(b) directing part of the used scrubbing liquor from the agitated crystallization zone to an inlet in the lower portion of a quiescent crystallization zone, and settling said crystals therein back into the agitated crystallization zone,

(c) removing an underflow stream of crystal-containing liquor from the agitated crystallization zone and separate overflow stream of crystal-containing liquor from an upper part of the quiescent crystallization zone, the ratio

of said underflow stream to said overflow stream being adjusted to cause crystals above a predetermined size to settle from the quiescent zone back into said agitated zone, rather than being carried out in the overflow stream, to promote secondary crystal nucleation.

4,294,808

PRODUCTION OF ANTICORROSIVE PIGMENTS CONTAINING PHOSPHORUS

Horst-Dieter Wasel-Nielen; Renate Adrian; Herbert Panter, all of Hürth; Gero Heymer, Erftstadt; Alexander Maurer, and Raban von Schenck, both of Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 17, 1979, Ser. No. 76,307

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 2840820

Int. Cl.³ C01B *25/26, 25/32, 25/36, 25/37*

U.S. Cl. 423—305 **8 Claims**

1. In a process for making phosphorus-containing anticorrosive pigments having a size of at most 20 microns by reacting at least one compound of the metals selected from the group consisting of magnesium, calcium, strontium, barium, zinc, aluminum, iron, chromium and manganese with an oxygen acid of phosphorus or an alkali metal or ammonium salt of said acid at temperatures within the range 10° to 100° C., the improvement which comprises: intimately mixing and thereby reacting an aqueous suspension or solution of the reactants inside a dispersing means rotating at a speed of 3000 to 10,000 rpm, separating and drying precipitated pigment, the pigment consisting to an extent of at least 90% of particles with a size between 0.05 and 8 microns.

4,294,809

AERATION OF PHOSPHORIC ACID

Richard N. Hill, Lakeland, Fla., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 54,449, Jul. 3, 1979, which is a continuation-in-part of Ser. No. 951,804, Oct. 16, 1978, abandoned, which is a continuation of Ser. No. 767,175, Feb. 9, 1977, abandoned, which is a division of Ser. No. 683,756, May 6, 1976, abandoned, said Ser. No. 54,449, is a continuation-in-part of Ser. No. 883,381, Mar. 6, 1978, Pat. No. 4,164,550, said Ser. No. 883,381, and Ser. No. 951,804, each is a continuation-in-part of Ser. No. 812,319, Jul. 1, 1977, Pat. No. 4,110,422, which is a continuation-in-part of Ser. No. 683,756,. This application Sep. 29, 1980, Ser. No. 191,940

Int. Cl.³ C01B *25/16*

U.S. Cl. 423—321 R **4 Claims**

1. In the method of making wet process phosphoric acid analyzing about 56–63% P_2O_5 prepared by steps including

(a) clarifying crude feed acid in a clarifier, said feed acid analyzing about 26–36% P_2O_5, and containing Fe^{++} and Fe^{+++}, the weight ratio of Fe as Fe_2O_3:P_2O_5 being 0.04–0.065:1;

(b) treating the clarified acid with aluminum silicate;

(c) concentrating the treated acid to about 46–52% P_2O_5;

(d) settling solids in the concentrated acid in a crystallizer-settler providing an overflow and an underflow;

(e) further concentrating the overflow in (d) to about 56–63% P_2O_5;

the improvement comprising aerating with strong agitation the clarified acid resulting from step (a) to oxidize at least some Fe^{++} to Fe^{+++}, whereby post-precipitation characteristics of the acid are improved.

4,294,810

ALKALI CALCIUM SILICATES AND PROCESS FOR PREPARATION THEREOF

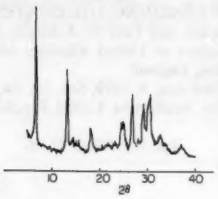
Genji Taga, Shinnanyo; Teruo Oikawa, Kudamatsu, and Yoshiaki Watanabe, Hikari, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Division of Ser. No. 54,810, Jul. 5, 1979. This application Feb. 27, 1980, Ser. No. 125,186

Claims priority, application Japan, Jul. 7, 1978, 53-81935; Jul. 11, 1978, 53-83565; Aug. 7, 1978, 53-95397; Sep. 21, 1978, 53-115131; Dec. 5, 1978, 53-158639

Int. Cl.³ C01B *33/24*

U.S. Cl. 423—331 **23 Claims**



1. An alkali calcium silicate having an X-ray diffraction pattern having diffraction peaks at spacings (d) of 13.0–13.4 Å, 6.7 Å and 3.1 Å said silicate having a composition represented by the following formula:

$$aNa_2O.bK_2O.cCaO.dSiO_2.eH_2O$$

wherein a is zero or a number larger than 0, b is zero or a number larger than 0, c is a number of from 7 to 9, d is a number of from 30 to 34 and e is a number of from 0 to 30, with the proviso that the sum of a and b is larger than 0 but smaller than or equal to 8.

8. A process for the preparation of alkali calcium silicates, which comprises subjecting an aqueous suspension of an alkali component, a calcium component and a silicon dioxide component to hydrothermal reaction under pressure at a temperature of 150° to 250° C., wherein the silicon dioxide component is a soluble silicon dioxide component and the hydrothermal reaction is carried out under conditions satisfying the requirement defined by the following formula combination (H):

$$\begin{aligned} &0.00533t + 0.4 \leqq T \leqq 0.008t + 0.8 \\ &0.0002t - 0.025 < U \leqq 0.04 \end{aligned} \quad \text{(H)}$$

wherein T stands for the starting material charge coefficient, said coefficient T being represented by the following formula (A):

$$T = \frac{9Y - 32Z}{9X - 12Z} \quad \text{(A)}$$

wherein X stands for the amount (moles) of the alkali component as R_2O contained in the aqueous suspension, in which R is an alkali metal selected from the group consisting of sodium and potassium, Y stands for the amount (moles) of the silicon dioxide component as SiO_2 contained in the aqueous suspension and Z stands for the amount (moles) of the calcium component as CaO contained in the aqueous suspension, when an alkali metal salt is formed as a by-product by the reaction, or the following formula (B):

$$T = \frac{9Y - 32Z}{9X - 3Z} \quad \text{(B)}$$

wherein X, Y and Z are as defind above, when an alkali metal salt is not formed as a by-product by the reaction, U stands for the alkalinity coefficient, said coefficient U represented by the following formula (C):

$$U = \frac{3X - 4Z}{3S} \quad (C)$$

wherein X and Z are as defined above and S stands for the amount (moles) of H_2O contained in the aqueous suspension, when an alkali metal salt is formed as a by-product by the reaction, or the following formula (D):

$$U = \frac{3X - Z}{3S} \quad (D)$$

wherein X, Z and S are as defined above, when an alkali metal salt is not formed as a by-product by the reaction, and t stands for the hydrothermal reaction temperature (°C.), whereby an alkali calcium silicate of the type 13 A is formed.

4,294,811

PROCESS FOR MANUFACTURING SI USEFUL FOR SEMICONDUCTOR COMPONENTS FROM QUARTZ SAND

Hubert Aulich, Munich, and Josef Grabmaier, Berg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 6, 1980, Ser. No. 194,336

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945141

Int. Cl.³ C01B *33/02*

U.S. Cl. 423—350 **18 Claims**

1. In a method of producing silicon which is useful for fabrication of semiconductor components, such as solar cells, wherein quartz sand is utilized as a starting material and silicon is obtained through reduction of silicon dioxide in an electrical arc process, the improvement comprising:

(a) admixing select amounts of quartz sand with suitable amounts of glass-forming materials and melting such admixture and converting it into glass;

(b) annealing the so-obtained glass at an elevated temperature below the temperature utilized to form such glass to that a phase-separation occurs comprised of a silicon dioxide-rich phase and an impurity-rich phase;

(c) subjecting the so-annealed glass to a leaching-out process with an acid and/or lye so that the impurity-rich phase is extracted; and

(d) admixing the remaining silicon dioxide-rich glass with a carbon-containing compound and reducing such glass to silicon in an electrical arc.

4,294,812

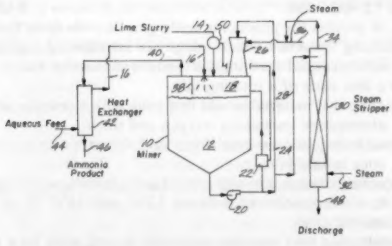
RECOVERY OF AMMONIA FROM AQUEOUS STREAMS

Robert A. Oler, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 909,674, May 25, 1978, abandoned. This application Sep. 7, 1979, Ser. No. 73,316

Int. Cl.³ C01C *1/02*

U.S. Cl. 423—357 **21 Claims**



8. A method of recovering ammonia from a continuously circulating aqueous stream containing an ammonium compound capable of reacting with lime to form free ammonia in solution, which consists essentially of the steps of:

(a) contacting the continuously circulating aqueous stream with a lime slurry to form a mixture containing free ammonia in solution and continuing the circulating of the mixture to maintain solids thereof in suspension;

(b) contacting the mixture of step (a) while continuously circulating with the vapor stream from step (c) and steam to form a heated liquid mixture and an ammonia-rich product vapor,

(c) contacting a portion of the continuously circulating heated liquid mixture from step (b) with steam in a stripping zone to form a liquid waste stream and a vapor stream containing free ammonia and steam; and

(d) recovering ammonia-rich product vapor.

4,294,813

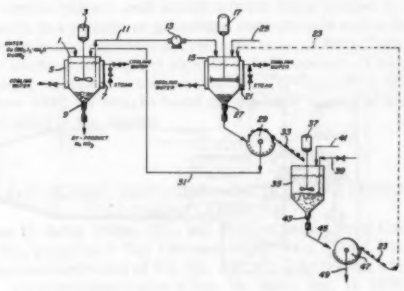
PROCESS FOR FORMING CALCIUM NITRITE

James M. Gaidis, Ellicott City, and Arnold M. Rosenberg, Potomac, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Sep. 23, 1980, Ser. No. 189,993

Int. Cl.³ C01B *21/20;* C01D *9/00*

U.S. Cl. 423—385 **13 Claims**



12. A method for preparing aqueous solutions of calcium nitrite comprising the successive steps of:

(a) forming an aqueous solution of sodium nitrite and calcium nitrate;

(b) cooling said solution to insolubilize sodium nitrate and form an aqueous solution of calcium nitrite; and

(c) separating the aqueous calcium nitrite solution from the insoluble sodium nitrate.

4,294,814

CARBON BLACK PROCESS AND REACTOR

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 895,430, Apr. 12, 1978, Pat. No. 4,224,284, which is a continuation-in-part of Ser. No. 498,776, Aug. 19, 1974, abandoned. This application Mar. 28, 1980, Ser. No. 134,856

Int. Cl.³ C09C *1/50*

U.S. Cl. 423—457 **9 Claims**

1. In a process for the production of carbon black by the pyrolytical decomposition of hydrocarbons comprising the steps

(a) introducing hydrocarbons along the axis of a tubularly shaped longitudinal reactor having an upstream confining wall,

(b) introducing hot combustion gases of nonstoichiometric composition tangentially into said reactor at a location close to said upstream confining wall to form a vortex of hot combustion gases spinning around the axial hydrocarbon stream,

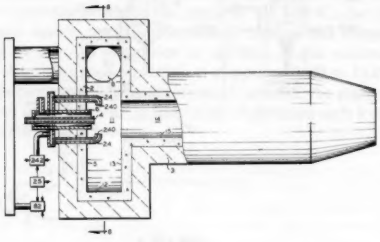
(c) withdrawing carbon black containing smoke from the downward end of said reactor, the improvement comprising

(d) introducing hot combustion gases of nonstoichiometric composition opposite to the nonstoichiometric composition of the tangentially introduced hot combustion gases radially inwardly toward its longitudinal axis into the reactor from orifices located radially at a distance from the axially introduced hydrocarbon stream and located axially at a distance from said upstream confining wall and located within said vortex, the nonstoichiometric compositions of said tangentially introduced hot combustion gases as well as of said radially inwardly introduced hot combustion gases being such that said radially inwardly introduced hot combustion gases mixed with a portion of the tangentially introduced hot combustion gases form a stoichiometric hot combustion gas mixture, and

(e) contacting said stoichiometric hot combustion gas mixture with said axially introduced hydrocarbon stream to effect pyrolytical decomposition thereof.

4. A carbon black reactor comprising:

(a) a housing with tubular-shaped interior from heat resistant material having an upstream confining wall arranged essentially orthogonally to the longitudinal axis of the reactor,



(b) first conduit means for axial introduction of hydrocarbon feed into said housing, said first conduit means being arranged extending axially through said upstream confining wall,

(c) a cylindrical portion of said housing attached to said upstream confining wall,

(d) second conduit means for tangential introduction of combustion gases into said housing, said second conduit means being arranged extending tangentially through said cylindrical portion of the housing close to said confining wall,

(e) third conduit means for radially inward introduction of a gas into said housing, said third conduit means comprising a plurality of conduits extending into the interior of the reactor and ending in openings facing the stream of axially introduced hydrocarbon feed, said conduits extending axially through said confining wall and end turned 90° from the axial direction toward the radial direction,

(f) means to withdraw the carbon black smoke from the downstream end of the reactor.

4,294,815

PROCESS OF PRODUCING CHLORINE DIOXIDE AND, IF DESIRED, CHLORINE

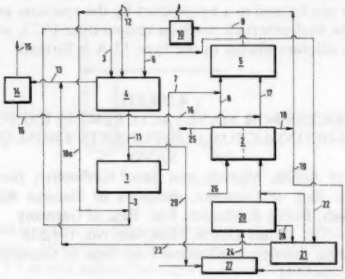
Karl Lohrberg, Heusenstamm; Siegfried Bielz, Frankfurt am Main, and Paul Janisch, Steinau, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 13, 1979, Ser. No. 93,708

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1978, 2849250

Int. Cl.³ C01B *11/02*

U.S. Cl. 423—478 **13 Claims**



1. A process for producing ClO_2 which comprises

(A) feeding aqueous NaCl into an electrolyte membrane cell and therein electrolyzing the same to obtain H_2 Cl_2, NACH

(B) reacting the H_2 and Cl_2 formed in step A to form HCl;

(C) feeding HCl from step B into a chlorate reaction zone;

(D) feeding $NaClO_3$ into said chlorate reaction zone, with $NaClO_3$ being obtained as a product of an electrolysis of NaCl;

(E) reacting sodium chlorate with hydrochloric acid in said chlorate reaction zone to form chlorine dioxide chlorine and sodium chloride;

(F) separating said ClO_2 and Cl_2 from NaCl and electrolyzing said NaCl in an electrolysis cell to obtain $NaClO_3$ and recycling the same to step D.

4,294,816

PROCESS FOR PRODUCING HYDROGEN FLUORIDE FROM FLUORINE CONTAINING MATERIALS BY CONTINUOUS PYROHYDROLYSIS

Jorg Kruger, Schwandorf; Roland Thome, Bonn; Dieter Moritz, Lunen; Hubert Bings, Lunen, and Herbert Losert, Lunen, all of Fed. Rep. of Germany, assignors to Vereinigte aluminium-Werke Aktiengesellschaft, Bonn, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 198,217

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1979, 2942439

Int. Cl.³ C01B *7/19*

U.S. Cl. 423—484 **9 Claims**

1. A process for producing hydrogen fluoride from fluorine containing materials which comprises introducing a quantity of a solid material containing a mixture of fluorine and carbon into a first zone of a rotating kiln,

heating said material in said first zone with a countercurrent atmosphere containing oxygen and steam,

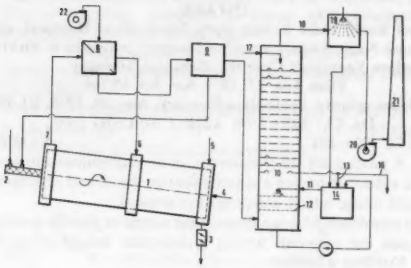
conducting said material from said first zone to a second zone in said kiln,

injecting oxygen into said second zone, heating said material to a temperature of between 1200° and 1800° C. in said second zone,

conducting said material from said second zone to a third zone in said kiln,

said third zone having an atmosphere comprising steam,

injecting said steam into said kiln to create a turbulent flow of steam and oxygen in said kiln,



and continuously recovering said hydrogen fluoride from said third zone.

4,294,817

METHOD OF FLUORO IMMUNOASSAY

Michael W. Burgett, El Granada, and Richard A. Harte, Redwood City, both of Calif., assignors to International Diagnostic Technology, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 854,613, Nov. 25, 1977, abandoned. This application Sep. 18, 1978, Ser. No. 943,314

Int. Cl.[3] **G01N** *33/58, 33/54, 21/25, 1/28*

U.S. Cl. 424—8 **14 Claims**

1. An immunofluorescence method of testing for the presence of an analyte where a test sample may contain an unknown amount of an interfering material which comprises preparing a first surface having bound thereto an antigen for the analyte with which the interfering material may interfere, preparing a second surface which is adapted to bind a broad spectrum of protein materials including said interfering materials but which does not bind any substantial amount of said analyte, performing an immunoassay of an unknown serum sample with said first and second surfaces by (a) immersing said first surface in an aliquot of said unknown serum, (b) immersing said first surface in an aliquot of a fluorescent labeled material adapted to bind to antibodies in the serum sample, (c) immersing the second surface in an aliquot of said unknown serum, (d) immersing said second surface in an aliquot of a fluorescent labeled material adapted to bind to antibodies in the serum sample, and thereafter measuring the difference in the amount of labeled material on the first and second surfaces.

2. An imminofluorescence method for the detection of an analyte in serum in the presence of interfering sera constituents comprising:

(a) providing two test surfaces each nonreactive with the analyte but capable of binding a broad spectrum of serum components;

(b) binding an antigen for the analyte on only one of the surfaces;

(c) moving the test surfaces through an aliquot of serum to be tested and a fluorescent labeled material;

(d) measuring quantitatively the fluorescence of each surface and subtracting the measurement of one of the surfaces from the other surface measurement to provide an analyte specific fluorescent measurement.

14. The method of claim **2** in which the test surfaces are mounted on a single sampler.

4,294,818

METHODS AND MATERIALS FOR DETECTION OF MULTIPLE SCLEROSIS

John McMichael, Cambridge Springs, Pa.; Ellis L. Kline, Pendleton, S.C., and James G. Spaulding, Saegertown, Pa., assignors to University Patents, Inc., Norwalk, Conn.

Filed Jul. 30, 1979, Ser. No. 61,759

Int. Cl.[3] **G01N** *33/48, 33/50, 33/54*

U.S. Cl. 424—12 **6 Claims**

1. A diagnostic reagent for use in serological determination of the presence of a multiple sclerosis disease state in a human patient, said reagent comprising heterologous species antibodies obtained by means of a heterologous species immune response to exposure to components of a homogenizate of lymphocytes of a human patient suffering from multiple sclerosis.

4,294,819

ALKALINE ANALGESIC CAPSULE

Thomas M. Tencza, Wallington, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Filed Aug. 18, 1980, Ser. No. 179,191

Int. Cl.[3] **A61K** *9/48, 31/60, 33/10, 33/12*

U.S. Cl. 424—14 **13 Claims**

1. As a unit dosage form a capsule having incorporated therein an alkaline tablet having a fast distintegration rate and an aspirin mixture; said aspirin mixture being present in said capsule as a powder or granulated material; said aspirin being present in said capsule at a level in the range of from about 160 mg. to about 500 mg. per capsule; and the quantity of alkaline material contained in said capsule being between about 30% to about 100% by weight based on the total weight of aspirin contained in the capsule.

4,294,820

POLYMERIC DIFFUSION MATRIX CONTAINING PHENYLEPHRINE

Alec D. Keith, Miami, Fla., and Wallace Snipes, State College, Pa., assignors to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation-in-part of Ser. No. 109,242, Jan. 3, 1980, which is a continuation-in-part of Ser. No. 2,565, Jan. 11, 1979, abandoned, and Ser. No. 47,084, Jun. 11, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,101

Claims priority, application Japan, Aug. 14, 1979, 54-103459

Int. Cl.[3] **A61L** *15/03;* **A61K** *31/79*

U.S. Cl. 424—28 **10 Claims**

1. A self-supporting polymeric diffusion matrix for the sustained release of phenylephrine in order to transdermally deliver said phenylephrine to a patient and provide said patient with a decongestant effect, said matrix comprising from about 2 to about 60% of a polar plasticizer, from about 6 to about 20% by weight polyvinylalcohol, from about 2 to 10% by weight polyvinylpyrrolidone, and a pharmaceutically effective amount of phenylephrine to provide a sustained release of said phenylephrine over a prolonged period.

4,294,821

ODOR ABSORBING COMPOSITIONS

Phillip J. Neumiller, Racine County, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 15, 1980, Ser. No. 216,411

Int. Cl.[2] **A61L** *13/00, 9/01*

U.S. Cl. 424—45 **10 Claims**

1. An odor absorbing composition comprising:

(a) from about 0.5 to 45% by weight of diethylene glycol;

(b) from about 0.5 to 45% by weight of propylene glycol;

(c) from about 0.5 to 30% by weight triethylene glycol;

(d) from about 1 to 50% by weight of glycerine;

(e) from about 0.1 to 20% by weight of a diethanol amide of a C_{16} to C_{18} unsaturated fatty acid, and

(f) from about 0.05 to 5% by weight of an unsaturated fatty acid.

10. A solid air treating composition which comprises an

absorbent substrate containing from 10 to 200% by weight based on the weight of the substrate of the composition of claim 1.

4,294,822

5-AMINOALKYL-4,4,8-TRIALKYLPSORALENS

Kurt D. Kaufman, Kalamazoo, Mich. (by Marilee Kaufman, conservator), assignor to Thomas C. Elder, Inc., Hamilton, Ind.

Filed Jul. 29, 1980, Ser. No. 173,437
Int. Cl.[3] C07D *493/02;* A61K *31/365*
U.S. Cl. 424—59 6 Claims

1. 5'-primaryaminoloweralkyl-4',4,8-triloweralkylpsoralen.

3. The method of effecting photochemical sensitivity on the skin of a mammal comprising the step of orally administering to the said mammal an effective photosensitizing dose of a compound of claim 1.

4,294,823

ASTRINGENT OR DEGREASING LOTION

Thomas J. Elliott, London, and David Ford, Isleworth, both of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 965,790, Dec. 4, 1978, abandoned. This application Dec. 26, 1979, Ser. No. 107,275
Claims priority, application United Kingdom, Nov. 26, 1977, 49304/77
Int. Cl.[3] A61K *7/00, 7/035, 7/48, 31/74*
U.S. Cl. 424—78 1 Claim

1. A cosmetic ethanol:water based astringent or degreasing lotion which provides a long lasting smoothing and matting effect comprising in suspension in said lotion base from 3 to 10% by weight of spherical or substantially spherical particles of polystyrene, polymethylmethacrylate or polyethylene, said particles having an average particle side of 5 to 7 microns, together with a skin emoillent and a cosmetically acceptable suspending agent, said ethanol: water being present relative to one another in a ratio of from 1:19 to 19:1.

4,294,824

EXTRACTS OF THE HEMOPOIETIC SYSTEM

William A. Jones, Staines; Tse Lin Sin Tse Hing Yuen, Harpenden, both of England; Tapio Rytomaa, Helsinki, Finland; Norman J. Harper, Pyrford, and Henry F. Frost, Hemel Hempstead, both of England, assignors to The Union International Company, Ltd., England

Continuation-in-part of Ser. No. 667,217, Mar. 15, 1976, abandoned. This application Jun. 19, 1978, Ser. No. 917,076
Claims priority, application United Kingdom, Aug. 5, 1975, 32659/75
Int. Cl.[3] A61K *35/14*
U.S. Cl. 424—101 5 Claims

1. A pharmaceutical composition for producing temporary remissions with minimal serious side effects in the treatment of myeloid leukaemia in human patients in intravenous injectable form which comprises an antimyeloid leukaemic effective amount of granulocytic chalone having an elemental analysis of carbon 43.6%, hydrogen 5.8% and nitrogen 6.0%, a molecular weight less than 1.500 daltons when determined by gel techniques and having an infrared spectrum as shown in FIG. 10, sufficient to produce such remissions without impairing the immune defense system of the patient as the active therapeutic agent in combination with a pharmaceutically acceptable carrier suitable for intravenous injection to human patients.

4,294,825

PROCESS FOR THE PRODUCTION OF AN ANDREXOGENIC SUBSTANCE HAVING SPECIFIC EFFECT ON THE CENTRAL REGULATION OF FOOD INTAKE

Jozsef Knoll; Huba Kalasz; Berta Knoll, all of Budapest, and Janos Nagy, Szentendre, all of Hungary, assignors to Richter Gedeon Vegyészeti Gyár RT, Budapest, Hungary

Filed Aug. 23, 1979, Ser. No. 68,766
Claims priority, application Hungary, Aug. 29, 1978, RI 683
Int. Cl.[3] A23J *1/06;* A23K *1/04;* C07G *7/00*
U.S. Cl. 424—101 5 Claims

1. A process for the preparation of an endogenous anorexogenic substance having a satiety effect on the central regulation of food intake which comprises the steps of:

(a) membrane filtering mammalian serum or plasma to separate out materials having a molecular weight of up to 50,000 as a filtrate;

(b) drying the filtrate;

(c) dissolving the filtrate dried during step (b) in water;

(d) chromatografically fractioning on a gel with a void volume under 50,000 the filtrate dissolved during step (c) with a 'neutral', aqueous, eluting salt solution containing at least 0.1% of the salt to obtain a fraction with high anorexogenic activity;

(e) drying the fraction with high anorexogenic activity;

(f) dissolving the fraction with high anorexogenic activity in water;

(g) subjecting the fraction with high anorexogenic activity to a second chromatographic fractioning on a gel with a void volume under 50,000 with distilled water to obtain a second fraction of higher anorexogenic activity; and

(h) lyophilizing the second fraction of higher anorexogenic activity.

4,294,826

PROCESS FOR THE PREPARATION OF HIGHLY PURIFIED ANTIHEMOPHILIC FACTOR

Fred Feldman, Park Forest, Ill., assignor to Armour Pharmaceutical Company, Tuckahoe, N.Y.

Filed May 7, 1980, Ser. No. 147,441
Int. Cl.[3] A61K *35/14, 37/00*
U.S. Cl. 424—101 4 Claims

1. A process for the preparation of an aqueous composition of antihemophilic factor having a concentration of about 20 to 45 units of antihemophilic factor per ml, a specific antihemophilic factor activity of at least 1 unit per mg protein, and being obtained from an aqueous solution of antihemophilic factor derived from human blood plasma, said aqueous solution having a concentration of about 5 to 15 units of antihemophilic factor per ml, and a specific antihemophilic factor activity of about 0.3 to 1.0 unit per mg protein, which comprises:

(a) effecting about a 2- to 10-fold concentration of the low concentrate solution,

(b) adjusting the pH of said concentrated solution to about 5.0 to 6.0,

(c) cooling the resultant solution to about 0 ° to 14° C.,

(d) removing the precipitate which forms at said pH and temperature,

(e) further clarifying the solution from step (d), and

(f) adjusting the pH to about 7.0.

3. A freeze-dried composition of antihemophilic factor derived from human blood plasma, having about 1 to 10 units antihemophilic factor activity per mg protein with a ratio of antigenic Factor VIII to Factor VIII procoagulant activity of approximately one and being substantially free of denatured antihemophilic factor.

4,294,827

ANTIBACTERIAL AND GROWTH PROMOTING β-LACTAM ANTIBIOTICS CARRYING AN -YLIDENE-2-PYRROLIDINON-1-YL RADICAL

Michael Preiss, and Karl G. Metzger, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

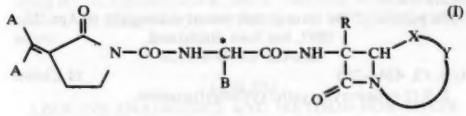
Filed Dec. 20, 1977, Ser. No. 862,452

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658905

Int. Cl.[3] **A61K** *31/655;* **C07D** *499/68, 501/22, 501/34*

U.S. Cl. 424—226 **17 Claims**

1. A β-lactam antibiotic of the formula (I)



(I)

in which

A and A′ represent hydrogen; alkyl of up to 5 carbon atoms optionally substituted by halogen, cyano or nitro; a phenyl, naphthyl or furyl radical; or a group of the formula R_1—X′

in which

X′ denotes a-CO— or —SO_2— group and

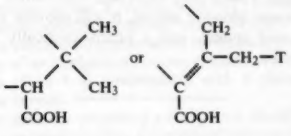
R_1 denotes hydrogen; alkyl of up to 5 carbon atoms optionally substituted by halogen, cyano or nitro; a phenyl, naphthyl, thienyl, furyl, pyrrolidyl or piperidyl radical; amino; monoalkylamino or dialkylamino of up to 4 carbon atoms per alkyl group, it being furthermore possible for R_1 to denote alkoxy of up to 4 carbon atoms if X′ represents the -CO- group;

R represents H or OCH_3,

B represents phenyl, methylphenyl, chlorophenyl, hydroxyphenyl, furyl or the radical

X represents S, SO or SO_2; and

Y represents the group

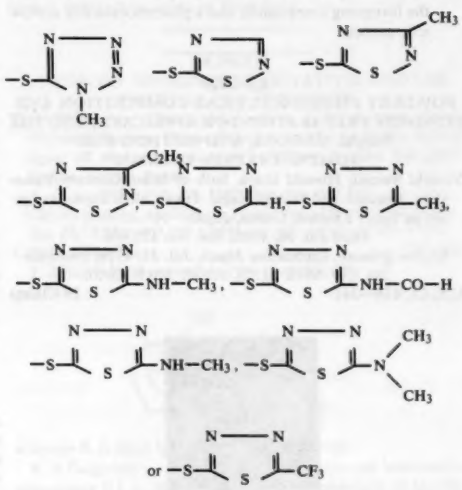


in which

the carbon atom which carries the carboxyl group is bonded to the nitrogen atom of the β-lactam ring and T denotes hydrogen, C_{1-4}- alkyl-CO-O, pyridinium, aminopyridinium, carbamoyloxy, azido, cyano, hydroxyl, the group -S-phenyl, which can be substituted by halogen, amino, lower alkylamino, di-lower alkylamino, lower alkyl, cycloalkyl of 3–7 ring carbon atoms, lower alkoxy, trifluoromethyl, phenyl, benzyl or acylamino with 2 to 5 carbon atoms, or the group —S—Het,

in which

Het represents



optionally substituted by halogen, amino, lower alkylamino, di-lower alkylamino, lower alkyl, cycloalkyl of 3–7 ring ring carbon atoms, lower alkoxy, trifluoromethyl, phenyl, benzyl or acylamino with 2 to 5 carbon atoms; or a pharmaceutically acceptable salt thereof.

13. An antibacterial and growth promoting composition containing as an active ingredient an effective amount of a compound according to claim **1** in admixture with a diluent.

4,294,828

NEW DERIVATIVES OF 4-AMINO-5-ALKYL SULPHONYL ORTHOANISAMIDES, METHODS OF PREPARING THEM AND THEIR APPLICATION AS PSYCHOTROPIC AGENTS

Michel Thominet, Paris; Jacques Acher, Itteville, and Jean-Claude Monier, Lardy, all of France, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile de-France, Paris, France

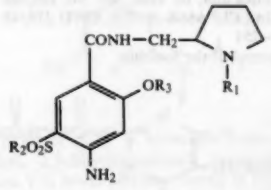
Filed Jan. 18, 1979, Ser. No. 4,397

Claims priority, application France, Jan. 20, 1978, 78-01632

Int. Cl.[3] **A61K** *31/40, 31/62;* **C07D** *207/08*

U.S. Cl. 424—232 **3 Claims**

1. A pharmaceutical composition having antiemetic or antiserotonin activity comprising an effective amount of a compound selected from the group consisting of 4-amino-5-alkylsulphonylortho-anisamides having the formula:



wherein:

R_1 is lower alkyl of 1 to 5 carbon atoms or lower alkenyl of 2 to 5 carbon atoms and R_2 and R_3 are lower alkyl of 1 to 5 carbon atoms,

the N-oxides of said anisamides, the addition salts of said derivatives with pharmacologically acceptable acids, the quaternary ammonium salts of said derivatives and the

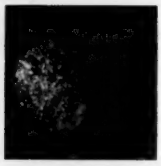
levorotatory and dextrorotatory optical isomers of all of the foregoing compounds, and a pharmaceutically acceptable carrier.

4,294,829

POWDERY PHARMACEUTICAL COMPOSITION AND POWDERY PREPARATION FOR APPLICATION TO THE NASAL MUCOSA, AND METHOD FOR ADMINISTRATION THEREOF

Yoshiki Suzuki; Hiroshi Ikura, both of Hino; Gentaro Yamashita, Koganei, and Tsuneji Nagai, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 30, 1980, Ser. No. 173,906
Claims priority, application Japan, Jul. 31, 1979, 54-96666
Int. Cl.[3] A61K *31/58, 31/56;* A01N *43/36*
U.S. Cl. 424—241 19 Claims



1. A powdery pharmaceutical composition for application to the mucosa of the nasal cavity, at least about 90% of which consists of particles having an effective particle diameter of about 20 to about 250 microns, said composition comprising a lower alkyl ether of cellulose selected from the group consisting of methyl cellulose, hydroxy-lower alkyl cellulose and carboxylate formed between alkali metals and carboxy-lower alkyl cellulose wherein said lower alkyls have 2 or 3 carbon atoms, said lower alkyl ether of cellulose having a viscosity, determined at about 37° C. for a 2% aqueous solution thereof, of at least about 5 centipoises and a pharmaceutically effective amount of a drug selected from the group consisting of a steroidal anti-inflammatory agent, a nonsteroidal anti-inflammatory agent, an anti-histaminic agent, an anti-allergic agent and a vasoconstrictor.

8. The composition of claim 1 wherein said steroidal anti-inflammatory agent is triamcinolone acetonide or beclomethasone dipropionate.

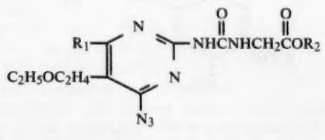
4,294,830

{[[4-AZIDO-5-(ETHOXYETHYL)-6-PHENYL-2-PYRIMIDINYL]AMINO]CARBONYL}GLYCINE AND ESTERS THEREOF

Hans A. Wagner, Skokie, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed Jun. 16, 1980, Ser. No. 159,703
Int. Cl.[3] A61K *31/505;* C07D *239/48*
U.S. Cl. 424—251 5 Claims

1. A compound of the formula



wherein R_1 is phenyl or substituted phenyl wherein the substituents are from one to three selected from lower alkyl, chloro, bromo, or fluoro; R_2 is hydrogen or C_1–C_4 alkyl; and when R_2 is hydrogen, a pharmaceutically acceptable salt thereof.

5. A pharmaceutical composition comprising a therapeutically effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,294,831

PURINE DERIVATIVES

Howard J. Schaeffer, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 718,105, Aug. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 662,900, Mar. 1, 1976, Pat. No. 4,199,574, and Ser. No. 608,263, Aug. 27, 1975, abandoned. This application Feb. 1, 1978, Ser. No. 874,060
Claims priority, application United Kingdom, Sep. 2, 1974, 38278/74
The portion of the term of this patent subsequent to Apr. 22, 1997, has been disclaimed.
Int. Cl.[3] C07D *473/18*
U.S. Cl. 424—253 14 Claims

1. 9-(2-propionyloxyethoxymethyl)guanine.

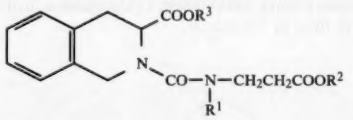
4,294,832

TETRAHYDROISOQUINOLINE COMPOUNDS AND A PHARMACEUTICAL COMPOSITION THEREOF

Naoto Yoneda, Suita; Jyoji Kato, Yawata, and Keizo Kinashi, Yao, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Apr. 10, 1980, Ser. No. 138,933
Claims priority, application Japan, Apr. 28, 1979, 54/52796; Jul. 17, 1979, 54/91123; Aug. 2, 1979, 54/98832
Int. Cl.[3] A61K *31/47;* C07D *217/16, 217/24*
U.S. Cl. 424—258 17 Claims

1. A tetrahydroisoquinoline compound of the formula:



(I)

wherein R^1 is alkyl of one to six carbon atoms, cycloalkyl of three to six carbon atoms, allyl or propargyl, R^2 is hydrogen or alkyl of one to six carbon atoms, and R^3 is hyrodgen, alkyl of one to six carbon atoms or benzyl, or a pharmaceutically acceptable salt thereof.

17. An inhibitory composition for the treatment of angiotensin-related hypertension comprising an amount of the compound of claim 1 such that, when said composition is administered to a warm blooded animal, it will provide an effective amount in said animal, and a pharmaceutically acceptable carrier therefor.

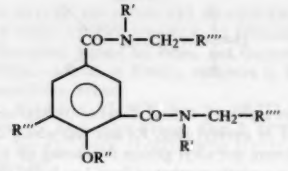
4,294,833

SUBSTITUTED 4-HYDROXY-ISOPHTHALIC ACID PICOLYLAMIDES HAVING A PHARMACEUTICAL ACTIVITY IN THROMBOEMBOLIC DISORDERS

Franco Innocenti; Giovanni Orzalesi, and Ivo Volpato, all of Florence, Italy, assignors to Societa Italo-Britannica, Florence, Italy

Filed Aug. 29, 1978, Ser. No. 937,732
Claims priority, application Italy, Sep. 6, 1977, 50896 A/77
Int. Cl.[3] A61K *31/44;* C07D *213/40*
U.S. Cl. 424—263 24 Claims

1. 4-hydroxy-isophthalic acid bis(3-or 4-picolylamides) of the formula I:



wherein R′ is H or an aliphatic or alicyclic hydrocarbon group with 1 to 6 carbon atoms, R″″ is 3-pyridyl or 4-pyridyl, R‴ is H, Cl, NO_2, or —OCH_3, R″ is an aliphatic or alicyclic hydrocarbon group with 1 to 8 carbon atoms, with the exception that when R″″ is 3-pyridyl and R′ and R‴ are both H, then R″ is an aliphatic or alicyclic hydrocarbon group with 3 to 8 carbon atoms.

4,294,834

AZOCINE ANALGESICS AND METHOD FOR THEIR PREPARATION

Johannes Hartenstein, Stegen-Wittental; Gerhard Satzinger, Denzlingen; Heinrich Bahrmann, Kirchzarten, and Volker Ganser, Freiburg, all of Fed. Rep. of Germany, assignors to Godecke Aktiengesellschaft, Freiburg, Fed. Rep. of Germany

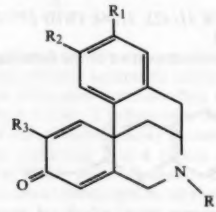
Filed Nov. 13, 1979, Ser. No. 93,314

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1978, 2849472; Jul. 7, 1979, 2927501

Int. Cl.[3] **C07D** *221/22;* **A61K** *31/435*

U.S. Cl. 424—260 **22 Claims**

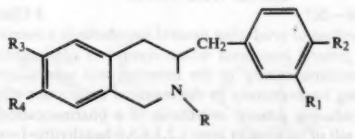
1. A compound having the structural formula:



wherein R is hydrogen, branched or straight chain alkyl of from 1 to 3 carbon atoms, branched or straight chain alkenyl of 2 to 5 carbon atoms, cycloalkylalkyl of from 4 to 8 carbon atoms, or benzyl or phenethyl the aromatic rings of which may be optionally substituted by from 1 to 3 alkoxy groups of 1 to 3 carbon atoms or methylenedioxy; R_1 is hydroxy or alkoxy of from 1 to 3 carbon atoms; R_2 is hydrogen or alkoxy of from 1 to 3 carbon atoms; R_1 and R_2 when taken together may form a methylenedioxy group; R_3 is alkoxy of 1 to 3 carbon atoms; and the pharmacologically acceptable salts thereof.

2. A pharmaceutical composition for treating pain consisting essentially of an analgesic-effective amount of a compound as defined in claim **1** in combination with a pharmaceutically acceptable carrier.

16. A process for preparing a compound as defined in claim **1** which comprises treating a compound having the structural formula II



II

with an oxidizing agent in the presence of a strong acid at a temperature of from −15° C. to +30° C.; wherein R, R_1, R_2 and R_3 are as defined in claim **2** and R_4 is hydroxy, alkoxy of from 1 to 6 carbon atoms or benzyloxy.

4,294,835

2-HYDROXY BENZAMIDE DERIVATIVES AND USE THEREOF AS A FUNGICIDE

Taizo Nakagawa; Hiroshi Matsumoto, both of Ageo; Kaoru Ohmori, Okegawa; Shizuo Shimano, and Kengo Koike, both of Ageo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

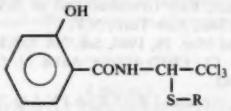
Filed Feb. 20, 1980, Ser. No. 123,766

Claims priority, application Japan, Feb. 27, 1979, 54-21350

Int. Cl.[3] **C07C** *103/26;* **C07D** *213/75;* **A01N** *43/40, 37/24*

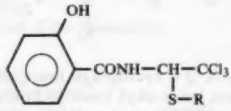
U.S. Cl. 424—263 **7 Claims**

1. A compound represented by the formula:



wherein R is alkyl having 1–12 carbon atoms.

6. A fungicidal composition for agriculture and horticulture comprising 0.5 to 95% by weight of a compound of the formula:



wherein

R is alkyl having 1–12 carbon atoms,

and 99.5 to 5% by weight of inert adjuvants.

4,294,836

1,3-DIHYDRO-6-(PYRIDINYL)-2H-IMIDAZO[4,5-B]PYRIDIN-2-ONES AND -IMIDAZO[4,5-B]-PYRIDINE-2-THIONES AND THEIR CARDIOTONIC USE

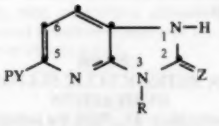
George Y. Lesher, Schodack, and Ruth P. Brundage, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 24, 1980, Ser. No. 132,907

Int. Cl.[3] **C07D** *471/04;* **A61K** *31/415*

U.S. Cl. 424—263 **14 Claims**

1. A 1,3-dihydro-3-R-5-PY-2H-imidazo[4,5-b]pyridin-2-one or -2-thione having the formula



where Z is O, or S, R is hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, or pharmaceutically-acceptable acid-addition salt thereof.

11. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to

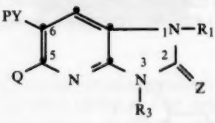
such patient an effective amount of the cardiotonic 1,3-dihydro-3-R-5-PY-2H-imidazo[4,5-b]pyridin-2-one or -2-thione or pharmaceutically-acceptable acid-addition salt thereof, where Z is O or S, R is hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,294,837
1,3-DIHYDRO-6-(PYRIDINYL)-2H-IMIDAZO[4,5-B]PYRIDIN-2-ONES AND -IMIDAZO[4,5-B]PYRIDINE-2-THIONES AND THEIR CARDIOTONIC USE

George Y. Lesher; Chester J. Opalka, Jr., both of Schodack, and Donald F. Page, East Greenbush, all of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 28, 1980, Ser. No. 135,105
Int. Cl.[3] C07D *471/04;* A61K *31/415*
U.S. Cl. 424—263 **12 Claims**

1. A 1,3-dihydro-1-R_1-3-R_3-6-PY-5-Q-2H-imidazo[4,5-b]pyridin-2-one or -2-thione having the formula



where Z is O or S, Q is hydrogen or lower-alkyl, R_1 and R_3 each are hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, at least one of R_1 or R_3 being hydrogen, and PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents, or pharmaceutically-acceptable acid-addition salt thereof.

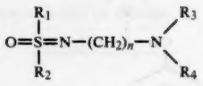
11. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient an effective amount of the cardiotonic 1,3-dihydro-1-R_1-3-R_3-6-PY-5-Q-2H-imidazo[4,5-b]pyridin-2-one or -2-thione or pharmaceutically-acceptable acid-addition salt thereof, where Z is O or S, Q is hydrogen or lower-alkyl, R_1 and R_3 each are hydrogen, lower-alkyl, lower-hydroxyalkyl, 2,3-dihydroxypropyl, lower-alkoxyalkyl or Y-NB where Y is lower-alkylene having at least two carbon atoms between its connecting linkages and NB is di-(lower-alkyl)amino or 4-morpholinyl, at least one of R_1 or R_3 being hydrogen, and PY or 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,294,838
CERTAIN HETEROCYCLIC SULFOXIMIDE DERIVATIVES

Peter Stoss, Mooswaldstr. 11,, 7801 Vorstetten; Gerhard Satzinger, Im Mattenbühl 7, 7809 Denzlingen; Manfred Herrmann, Wolfweg 25, 7811 St. Peter, and Wolfgang Heldt, Weidenmattenstr. 4, 7803 Emmendingen 16, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 971,139, Dec. 19, 1978, abandoned. This application May 15, 1980, Ser. No. 150,119
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758613
Int. Cl.[3] A61K *31/44;* C07D *213/62, 407/12, 409/12*
U.S. Cl. 424—263 **11 Claims**

1. Sulphoximide derivatives of the general formula:



wherein R_1 is a phenyl, thienyl, furyl or pyridyl ring; R_2 is a thienyl, furyl or pyridyl ring; R_3 and R_4, which can be the same or different, are alkyl groups containing up to 6 carbon atoms and n is a whole number of from 1 to 5; and the pharmaceutically acceptable salts thereof with organic and inorganic acids, as well as the pharmaceutically acceptable quaternary ammonium salts thereof.

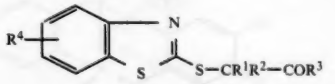
11. An anti-spasmodic composition, comprising a sulphoximide derivative according to claim **1**, in admixture with an inert solid or liquid pharmaceutical diluent or carrier.

4,294,839
BENZOTHIAZOLE DERIVATIVES AND PHARMACEUTICAL FORMULATIONS CONTAINING THEM

Thomas Doll, Mainz; Erich Schacht, Seeheim-Jugenheim; Hans-Eckart Radunz, Mühltal, and Ernst Schulze, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 12, 1980, Ser. No. 215,987
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950095
Int. Cl.[3] A61K *31/425, 31/44;* C07D *277/74, 417/12*
U.S. Cl. 424—263 **8 Claims**

1. A benzothiazole derivative of the formula



wherein R^1 is H or CH_3; R^2 is phenyl, tolyl, xylyl or pyridyl; R^3 is OH, alkoxy of 1–4 C atoms or $—NHCH_2CH_2OH$; and R^4 is H, Cl, Br, OH or alkoxy of 1–4 C atoms,

or a physiologically acceptable salt thereof.

8. A method of lowering the lipid level in a patient in need of such lowering, comprising administering to the patient an amount of a compound of claim **1** effective for such lowering.

4,294,840
KETAZOCINE ANESTHETIC METHOD OF USE

Alfred E. Farah, Shodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 11,107, Feb. 12, 1979, Pat. No. 4,217,354. This application Aug. 31, 1979, Ser. No. 71,774
Int. Cl.[3] A61K *31/445*
U.S. Cl. 424—267 **3 Claims**

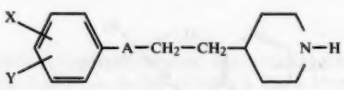
1. The method of producing general anesthesia in a mammal in need of general anesthesia which comprises administering diazepam intramuscularly to the mammal and subsequently administering intravenously to the mammal an amount effective for producing general anesthesia of a pharmaceutically acceptable salt of racemic or levo 1,2,3,4,5,6-hexahydro-1-oxo-3-cyclopropylmethyl-8-hydroxy-6(eq),11(ax)-dimethyl-2,6-methano-3-benzazocine.

4,294,841
DERIVATIVES OF 1-PHENYL 3-(4-PIPERIDYL) 1-PROPANONE USABLE AS DRUGS

Alain A. Champseix, Forges les Bains, and Gerard R. Le Fur, Plessis Robinson, both of France, assignors to Pharmindustrie, Gennevilliers, France

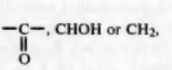
Filed Nov. 27, 1979, Ser. No. 97,772
Claims priority, application France, Dec. 5, 1978, 78 34185
Int. Cl.³ A61K *31/445;* **C07D** *211/32*
U.S. Cl. 424—267 **8 Claims**

1. A pharmaceutical composition, particularly useful as an antiarhythmic and for the treatment of states of depression and anxiety, which contains as an active agent a pharmaceutically effective amount of a compound corresponding to the formula:



(I)

wherein X and Y are the same or different and represent hydrogen, halogen, alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, alkylthio containing 1 to 4 carbon atoms, trifluoromethyl, hydroxy, amino, monoalkylamino containing 1 to 4 carbon atoms or amino substituted by alkylsulfonyl containing 1 to 4 carbon atoms, by alkylcarbonyl containing 1 to 5 carbon atoms or by benzoyl, and A represents



or a salt of said compound with a pharmaceutically acceptable acid, in a pharmaceutically acceptable carrier.

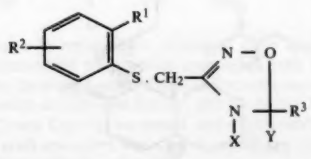
4. A chemical compound corresponding to formula (I) of claim **1**, wherein A is CH_2, Y is hydrogen or halogen or alkyl containing 1 to 4 carbon atoms, alkoxy containing 1 to 4 carbon atoms, alkylthio containing 1 to 4 carbon atoms, trifluoromethyl, hydroxy, amino, monoalkylamino containing 1 to 4 carbon atoms, or amino substituted by alkylsulfonyl containing 1 to 4 carbon atoms, by alkylcarbonyl containing 1 to 5 carbon atoms or by benzoyl and X is halogen or alkylthio containing 1 to 4 carbon atoms, alkoxy containing 2 to 4 carbon atoms, trifluoromethyl, hydroxy, amino or monoalkylamino containing 1 to 4 carbon atoms or amino substituted by alkylsulfonyl containing 1 to 4 carbon atoms, by alkylcarbonyl containing 1 to 5 carbon atoms or by benzoyl.

4,294,842
ANTI-PROTOZOAL OXADIAZOLE DERIVATIVES

John B. Weston, Tring, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 12, 1979, Ser. No. 56,997
Claims priority, application United Kingdom, Jul. 13, 1978, 29818/78
Int. Cl.³ A61K *31/42;* **C07D** *271/06*
U.S. Cl. 424—272 **7 Claims**

1. A compound of the formula (I)



(I)

wherein

R^1 is selected from the group consisting of hydrogen, lower alkyl, halogen, hydroxy, alkoxy or nitro;

each R^2 is the same or different and is selected from the group consisting of hydrogen, lower alkyl, halogen, hydroxy, alkoxy, aryloxy, alkylthio, arylthio, amino, substituted amino, cyano, nitro or together with an adjacent group R^2 a residue —CH=CH—CH=CH—;

or R^1 and one R^2 together form a residue —CH=CH—CH=CH—;

X and Y together represent a bond or are both hydrogen;

R^3 is selected from the group consisting of hydrogen, lower alkyl, aryl, and a group Ar—$S.CH_2$—; and

Ar is phenyl optionally substituted with one, two or three substituents which may be the same or different, and acid addition salts thereof.

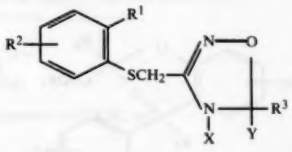
7. A method for the treatment of a protozoal infection in animal, including man, comprising administration of a non-toxic antiprotozoal-effective amount of a compound as defined in any one of claims **1** to **4**.

4,294,843
ANTI-PROTOZOAL OXADIAZOLE DERIVATIVES

John B. Weston, Tring, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 12, 1979, Ser. No. 56,998
Claims priority, application United Kingdom, Jul. 13, 1978, 29817/78
Int. Cl.³ A61K *31/42;* **C07D** *271/06*
U.S. Cl. 424—272 **17 Claims**

1. A compound of the formula (I):



(I)

wherein R^1 is selected from the group consisting of amino or substituted amino;

each R^2 is the same or different, in one or more of the 3, 4, 5 or 6 positions and is selected from the group consisting of hydrogen, lower alkyl, halogen, hydroxy, alkoxy, alkylthio, arylthio, amino, substituted amino, cyano or nitro;

X and Y together represent a bond or X and Y are both hydrogen;

R^3 is selected from the group consisting of hydrogen, lower alkyl, aryl, and a group —SCH_2Ar; and

Ar is phenyl, optionally substituted with one, two or three substituents which may be the same or different;

and acid addition salts thereof.

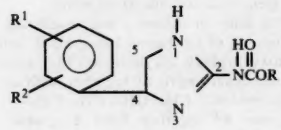
8. A method for the treatment of a protozoal infection in an animal including man, comprising administration of a non-toxic, anti-protozoal effective amount of a compound as defined in any one of claims **1** to **5**.

4,294,844
USE OF 4,5-DIHYDRO-2-LOWER ALKOXYCARBONYLAMINO-4-PHENYL IMIDAZOLES AND SUBSTITUTED PHENYL DERIVATIVES THEREOF AS ANTI-HYPERTENSIVE AGENTS

George S. Harris, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jun. 4, 1979, Ser. No. 44,900
Int. Cl.³ A61K *31/415*
U.S. Cl. 424—273 R **5 Claims**

1. A method for lowering the blood pressure in a hypertensive human being which comprises administering to said human being a therapeutically effective hypotensive amount of a compound chosen from those represented by the formula



(I)

wherein

R is lower alkyl;

R^1 is hydrogen, lower alkyl, hydroxy, lower alkoxy, fluoro, chloro, bromo, iodo or trifluoro methyl; and

R^2 is hydrogen or is a substituent which is identical to the R^1 substituent, and wherein R^1 and R^2 can be at any position on the phenyl ring or R^1 and R^2 together form methylenedioxy and are at adjacent carbon atoms on the phenyl ring, and the pharmaceutical salts thereof.

4,294,845

1,3-BENZODIOXIN DERIVATIVES

Daniel Humbert, Fontenay-sous-Bois; Francois Clemence, Paris, and Michele Dagnaux, Fontenay-sous-Bois, all of France

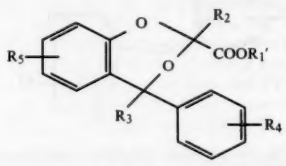
Continuation-in-part of Ser. No. 847,776, Nov. 2, 1977, abandoned. This application Apr. 30, 1979, Ser. No. 34,431

Claims priority, application France, May 3, 1978, 78 13094

Int. Cl.[3] **A61K** *31/335;* **C07D** *319/08*

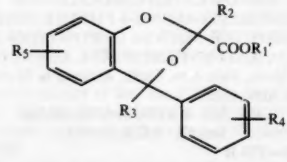
U.S. Cl. 424—278 Q **30 Claims**

1. A compound selected from the group consisting of racemic mixtures or optically active isomers of 1,3-benzodioxins of the formula



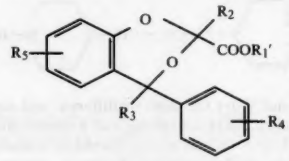
wherein R_1' is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, —NH_4, aluminum, non-toxic, pharmaceutically acceptable amines, alkyl of 1 to 5 carbon atoms, 2,3-dihydroxypropanyl, (2,2-dimethyl-1,3-dioxolan-4-yl)-methyl and dialkylaminolakyl with alkyls of 1 to 4 carbon atoms, R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and phenyl and R_4 and R_5 are individually selected from the group consisting of hydrogen and halogen and the non-toxic, pharmaceutically acceptable acid addition salts where R_1' is dialkylaminoalkyl with the proviso that R_2 and R_3 are not simultaneously hydrogen.

11. An hypolipemiant composition comprising an nypolipemiantly effective amount of at least one compound selected from the group consisting of racemic mixtures or optically active isomers of 1,3-benzodioxins of the formula



wherein R_1' is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, —NH_4, aluminum, non-toxic, pharmaceutically acceptable amines, alkyl of 1 to 5 carbon atoms, 2,3-dihydroxypropanyl, (2,2-dimethyl-1,3-dioxolan-4-yl)-methyl and dialkylaminoalkyl with alkyls of 1 to 4 carbon atoms, R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and phenyl and R_4 and R_5 are individually selected from the group consisting of hydrogen and halogen and the non-toxic, pharmaceutically acceptable acid addition salts where R_1' is dialkylaminoalkyl and an inert pharmaceutical carrier.

21. A method of inducing hypolipemiant activity in warm-blooded animals comprising administering a warm-blooded animals an hypolipemiantly effective amount of at least one compound selected from the group consisting of racemic mixtures or optically active isomers of 1,3-benzodioxins of the formula



wherein R_1' is selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, —NH_4, aluminum, non-toxic, pharmaceutically acceptable amines, alkyl of 1 to 5 carbon atoms, 2,3-dihydroxypropanyl, (2,2-dimethyl-1,3-dioxolan-4-yl)-methyl and dialkylaminoalkyl with alkyls of 1 to 4 carbon atoms, R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms, R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms and phenyl and R_4 and R_5 are individually selected from the group consisting of hydrogen and halogen and the non-toxic, pharmaceutically acceptable acid addition salts where R_1' is dialkylaminoalkyl.

4,294,846

HYPOCHOLESTEREMIC FERMENTATION PRODUCTS AND PRODUCTS OF PREPARATION

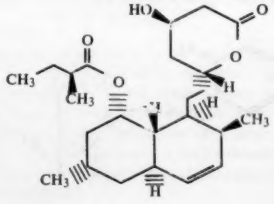
George Albers-Schonberg, Princeton, N.J.; Henry Joshua, Staten Island, N.Y., and Maria B. Lopez, Elizabeth, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 77,807, Sep. 21, 1979, abandoned. This application May 28, 1980, Ser. No. 154,157

Int. Cl.[3] **C07D** *309/30;* **A61K** *31/365*

U.S. Cl. 424—279 **2 Claims**

1. A compound, insubstantially pure form, with structural formula:



4,294,847

8-AMINOALKYL-4-ALKYLISOPSORALENS

Kurt D. Kaufman, Kalamazoo, Mich., assignor to Thomas C. Elder, Inc., Hamilton, Ind.

Filed Jul. 29, 1980, Ser. No. 173,384
Int. Cl.[3] C07D *493/04;* A61K *31/365*
U.S. Cl. 424—279 10 Claims

1. 4-loweralkyl-8-primaryaminoloweralkylisopsoralen or a non-toxic and pharmacologically-acceptable salt thereof.

5. The method of effecting photochemical sensitivity on the skin of a mammal comprising the step of orally or topically administering to the said mammal an effective photosensitizing dose of a compound of claim 1.

4,294,848

THIOCYANO-CONTAINING POLYOXYALKYLENES

David J. Tracy, Lincoln Park; Lindley S. Wood, Montclair, and Paritosh M. Chakrabarti, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 31, 1980, Ser. No. 174,291
Int. Cl.[3] A01N *47/48;* C07C *161/02*
U.S. Cl. 424—302 11 Claims

1. A thiocyano-containing polyoxyalkylene product having the formula:

$$NCS—(AO)_x—(BO)_y—(CO)_z—DE$$

wherein E is halogen or —SCN, A, C and D represent lower alkylene of 2 to 4 carbon atoms; B is alkylene of 2 to 8 carbon atoms; y and z are each integers having a value of from 0 to 50 and x is an integer having a value of from 2 to 50; and intermixtures of said thiocyano-containing polyoxyalkylene compounds.

10. The process of contacting a site of infestation of bacteria, fungi or a nematode with between about 0.05 and about 20 weight % of the product of claim 1 to arrest said infestation.

4,294,849

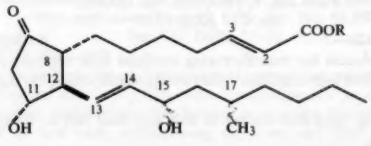
PROSTAGLANDIN ANALOGUES

Masaki Hayashi, Takatsuki; Sadahiko Iguchi, Otsu; Takanori Okada, Ibaraki, and Akiyoshi Kawasaki, Osaka, all of Japan, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 24, 1980, Ser. No. 114,804
Claims priority, application Japan, Jan. 29, 1979, 54-8904
Int. Cl.[3] C07C *177/00;* A61K *31/557*
U.S. Cl. 424—305 11 Claims

1. A prostaglandin analogue of the general formula:

VI



(wherein R represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, the wavy line ∿∿ indicates attachment of α- or β-configuration or a mixture thereof, and the double bonds between C_2–C_3 and C_{13}–C_{14} are trans), and cyclodextrin clathrates of such acids and esters, and when R represents a hydrogen atom, non-toxic salts of such acids.

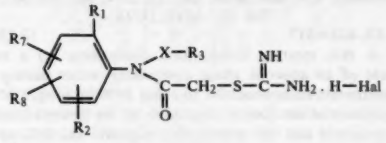
4,294,850

FUNGICIDAL ACYLANILIDES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 923,604, Jul. 11, 1978, Pat. No. 4,206,228, which is a division of Ser. No. 723,826, Sep. 16, 1976, Pat. No. 4,151,299, which is a continuation of Ser. No. 565,037, Apr. 4, 1975, abandoned. This application Dec. 7, 1979, Ser. No. 101,355
Claims priority, application Switzerland, Apr. 9, 1974, 4995/74; Mar. 14, 1975, 3259/75
Int. Cl.[3] A01N *37/10;* C07C *149/43*
U.S. Cl. 424—309 12 Claims

1. A fungicidal composition which contains as active substance a fungicidally effective amount of a compound of the formula



wherein

R_1 represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen,

R_2 represents hydrogen, alkyl of 1 to 3 carbon atoms, alkkoxy of 1 to 4 carbon atoms or halogen,

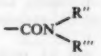
R_7 represents hydrogen, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen,

R_8 represents hydrogen or methyl,

the total number of carbon atoms of the substituents R_1, R_2, R_7 and R_8 in the phenyl ring not exceeding 8,

X represents $—CH_2—$ or

R_3 represents —COOR′ or



wherein each of R′, R″ and R‴ independently represents hydrogen, methyl or ethyl, and

Hal represents a halogen anion,

together with suitable carriers and optionally other agents which promote the application thereof.

7. A compound according to claim 1.

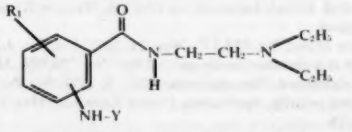
4,294,851

AMINOBENZOIC ACID DERIVATIVES

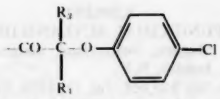
Gunter Metz, Auf dem Rucken 29, and Manfred Specker, Weilerhalde 32, both of Blaubeuren, Fed. Rep. of Germany

Filed Jun. 27, 1978, Ser. No. 919,747
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1977, 2730174
The portion of the term of this patent subsequent to Mar. 27, 1996, has been disclaimed.
Int. Cl.[3] A61K *31/17, 31/165;* C07C *101/00, 103/78*
U.S. Cl. 424—311 2 Claims

1. Aminobenzoic acid compounds of the formula:



wherein R_1 is hydrogen, chlorine, hydroxy, acetoxy or C_1—C_3—alkoxy; Y is the group:



wherein R_3 and R_4 are hydrogen or methyl and their acid addition salts.

4,294,852

SKIN TREATING COMPOSITIONS

Richard H. Wildnauer, East Brunswick, and William T. Humphries, Pennington, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 411,939, Nov. 1, 1973, abandoned. This application Aug. 21, 1975, Ser. No. 607,171

Int. Cl.³ A61K *31/19*

U.S. Cl. 424—317 **13 Claims**

1. A skin treating composition comprising (a) a major amount of an aqueous phase comprising water having dissolved therein from about 0.1 to about 35% by weight of said composition of an alcohol selected from the group consisting of n-propanol and the monohydric aliphatic alcohols having from 4 to 6 carbon atoms, and an effective amount, sufficient to adjust the pH of said composition to a pH within the range of about 2 to about 6.5, of an organic acid having from 2 to about 10 carbon atoms selected from the group consisting of the aliphatic mono-, di- and tri-carboxylic acids and the derivatives of said acids which are substituted at one or both of the alpha and beta carbons with a hydroxyl or keto group; and (b) no more than about 15% by weight of the total composition of a lipid phase.

5. The composition of claim **1**, further comprising an effective amount of a topically active pharmaceutical compound.

8. The composition of claim **5**, wherein said pharmaceutical compound is retinoic acid.

4,294,853

BIOCIDAL ADDITIVE FOR CUTTING FLUIDS

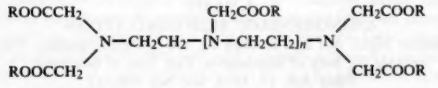
John W. Williams, Vallejo, Calif.; Robert A. Smith, Lindenhurst, and Francis W. Arbir, Itasca, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 48,202, Jun. 13, 1979, abandoned. This application Jun. 3, 1980, Ser. No. 156,141

Int. Cl.³ A01N *37/12*

U.S. Cl. 424—319 **12 Claims**

1. A mixture for use as a biocidal additive to industrial cutting fluids consisting essentially of 1 part by weight of 1,1-diiododimethyl sulfone and between 0.5 and 250 parts by weight of a chelating agent



wherein R is hydrogen, an alkali metal cation or ammonium, and n is 0 or 1.

4,294,854

PHARMACEUTICAL COMPOSITIONS

Graham J. Durant; Charon R. Ganellin, and Margaret R. Vickers, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

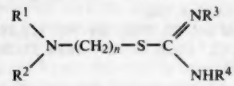
Division of Ser. No. 853,773, Nov. 21, 1977, Pat. No. 4,205,071, which is a continuation-in-part of Ser. No. 795,983, May 11, 1977, abandoned. This application Oct. 9, 1979, Ser. No. 82,836

Claims priority, application United Kingdom, May 14, 1976, 19994/76

Int. Cl.³ A61K *31/33, 31/155, 31/495*

U.S. Cl. 424—326 **4 Claims**

1. A method of producing immunosuppressant activity by administering to an animal in need thereof an effective amount of an isothiourea of the formula:



wherein

n is 2, 3 or 4;

R^1 and R^2, which may be the same or different, are lower alkyl; and

R^3 and R^4, which may be the same or different, are lower alkyl,

or a pharmaceutically acceptable acid addition salt thereof.

4,294,855

EMOLLIENT AND/OR DYED PRILLED UREA BATH BEAD COMPOSITION

Donald C. Wood, Des Plaines, and Robert L. McLaughlin, Wilmette, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 26, 1975, Ser. No. 635,282

The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.

Int. Cl.³ A61K *7/50*

U.S. Cl. 424—358 **9 Claims**

1. A bath bead composition comprising at least 50% by weight of beads of prilled urea, said beads having absorbed therein from 0.5–10% by weight of an oily emollient, and said beads being dyed with water soluble dye.

5. A bath bead composition comprising at least 50% by weight of beads of prilled urea, said beads having absorbed therein from 0.5–10% by weight of an oily emollient, and from 2–15% by weight of a foaming anionic surfactant being present in said composition.

9. A method of producing a dyed bath bead composition comprising mixing urea beads with water soluble dye in the form of a dry powder, said urea beads containing absorbed or adsorbed water to pick up said water soluble dye.

4,294,856

PROCESS FOR MANUFACTURE OF ARTIFICIAL MILK REPLACER FOR RAISING INFANT PIGS AND OTHER INFANT ANIMALS

Toyosuke Kinumaki; Takehiko Watanabe, both of Yokohamashi; Kisaburo Sugii, Hasudashi, and Shigeo Iseki, Tokyoto, all of Japan, assignors to Tokai Regional Fisheries Research Laboratory, Tokyo, Japan

Filed Jan. 4, 1977, Ser. No. 759,491

Int. Cl.³ A23L *1/33*

U.S. Cl. 426—7 **5 Claims**

1. A process for manufacturing artificial milk replacer for raising infant pigs and other infant animals comprising the steps of:

crushing meat and viscera of fish and shell fish to form a pulp;

digesting said pulp with protease;

heating the digested pulp to inactivate the protease,

removing the solid matter and suspended particles successively by screening, centrifuging, and filtering the digested pulp to obtain a liquid;

defatting the liquid with solvent;

condensing the defatted liquid; and

reducing the condensed liquid to a powder by spray-drying.

4,294,857
DOG FOOD COMPOSITIONS OF IMPROVED PALATABILITY TO DOGS

Mary L. Fuller, Pacific, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

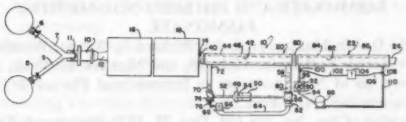
Filed Dec. 5, 1979, Ser. No. 100,600
Int. Cl.[3] A23K *1/00*
U.S. Cl. 426—99 43 Claims

1. A dog food composition having greater palatability to dogs than the same composition without the palatability enhancer, comprising a nutritionally balanced mixture of proteinaceous and farinaceous ingredients, and an added palatability enhancing 0.0001 to 0.01% by weight amount of linalool.

4,294,858
SELF-SURFACED MEAT PRODUCT MANUFACTURING METHOD AND APPARATUS

Rex E. Moule, 370 Grant Ave., Satellite Beach, Fla. 32937

Filed Mar. 27, 1980, Ser. No. 134,605
Int. Cl.[3] A23B *4/00*
U.S. Cl. 426—241 19 Claims



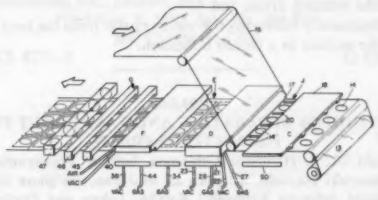
1. The method for preparing a self-surfaced congealed meat product comprising storing emulsified product in a container, forcing the emulsified product from the container, forcing the emulsified product through a tube at a predetermined rate against a back pressure, wherein back pressure is created by laterally constraining the product as it moves through the tube, passing microwave energy through the tube and into the product, continuing forcing of the product through the tube and continuing passage of microwave energy through the tube and into the product, thereby congealing the product while the product remains under pressure, heating the tube to temperature sufficient to melt materials on the outer surfaces of the product, conducting heat through the tube to outer surfaces of the product thereby forming a self-skin on the product while the product remains under pressure, subsequently cooling the tube and cooling the outer surfaces of the product while the product continually passes through the tube, thereby solidifying materials in the outer surfaces of the product and completing the forming of a self-skin, and releasing the product from the tube.

4,294,859
PROCESS FOR PACKAGING FOOD

Burton R. Lundquist, Highland Park, Ill., and Thomas Macherione, Mesa, Ariz., assignors to Armour and Company, Phoenix, Ariz.

Continuation of Ser. No. 568,016, Apr. 14, 1975, abandoned. This application Nov. 15, 1979, Ser. No. 94,380
Int. Cl.[3] B65B *31/04*
U.S. Cl. 426—410 12 Claims

1. A process for packaging foods comprising passing a unit of food between a top film and a bottom film into an open first chamber, said bottom film having an opening therein to one side of said unit, withdrawing air from said first chamber through a passage which is open at a position below said opening, whereby pressure within said chamber is reduced, sealing said top and bottom films along a line which extends about said unit and encloses said opening, introducing a gas which is substantially free of oxygen through a passage which opens at a position under said opening whereby to pass said gas upwardly through said opening and into the enclosure between said films until the presssure within said chamber is approximately that of the atmosphere surrounding said chamber, opening said chamber, passing said unit with said enclosure out of said chamber to a position in which a nozzle engages said opening, passing gas which is substantially free of oxygen through said nozzle and into said enclosure to flush said enclosure, passing said unit which has been flushed within said enclosure into an open second chamber, closing said second

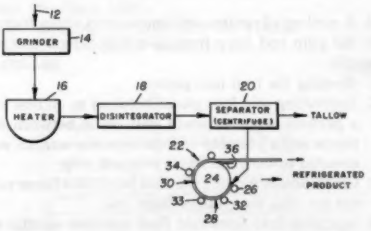


chamber, withdrawing gas from said second chamber through an outlet passage which is open at a position under said opening to draw gas through said opening and out of said second chamber through said outlet passage, and sealing said top and bottom films along a line extending about said unit and excluding said opening.

4,294,860
REFRIGERATING MEAT PASTE

Eldon N. Roth, 99 Madera Ct., San Ramon, Calif. 94583

Continuation-in-part of Ser. No. 970,579, Dec. 18, 1978, abandoned, which is a continuation of Ser. No. 849,166, Nov. 7, 1977, abandoned. This application Dec. 14, 1979, Ser. No. 103,498
The portion of the term of this patent subsequent to Jul. 4, 1995, has been disclaimed.
Int. Cl.[3] A23B *4/06;* A23L *1/31*
U.S. Cl. 426—417 19 Claims



17. In a process for treating a protein-containing meat product having a high fat content in order to first recover a substantial portion of the fat and then refrigerate remaining protein-containing solids in order to limit bacterial growth, the steps comprising,

heating the meat product in order to render and separate a substantial portion of the fat from the remaining protein-containing solid material,

forming the remaining solid material into a viscous paste,

refrigerating a cylindrical heat transfer surface of a rotating drum to a preselected temperature,

applying the viscous paste onto the heat transfer surface to form a sheet of the viscous paste on the heat transfer surface, the relatively high temperature of the viscous paste and the relatively low temperature of the heat transfer surface being selected so that, upon application of the viscous paste to the heat transfer surface, the relatively high temperature of the viscous paste is capable of causing congealed or frozen liquid at an interface between the heat transfer surface and the viscous paste to initially melt, the relatively low temperature of the heat transfer surface

immediately thereafter causing liquid components at the interface to form a congealed or frozen solid in order to cause adhesion of the viscous paste to the heat transfer surface, compressing the viscous paste sheet in order to improve heat transfer characteristics throughout its thickness,

cooling the viscous paste upon the heat transfer surface of the rotating drum, and

subsequently removing the viscous paste from the heat transfer surface in a frozen condition.

4,294,861

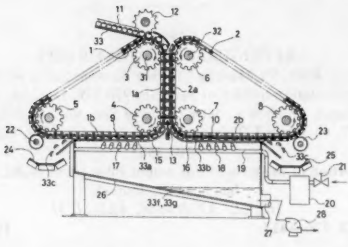
METHOD OF SEPARATING AND TAKING OUT PULP FROM CITRUS FRUITS

Yasushi Ifuku; Hirofumi Uchiyama, both of Wakayama, and Masayuki Hayashi, Komaki, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Prefectural Economic Federation of Agricultural Co-operatives, Wakayama, both of, Japan

Continuation of Ser. No. 17,853, Mar. 6, 1979. This application Jun. 27, 1980, Ser. No. 163,554

Int. Cl.[3] A23L *2/26*

U.S. Cl. 426—475 **7 Claims**



1. A method of continuously processing citrus fruits to separate the pulp and juice from said fruit which comprises the steps of:

1. dividing the fruit into pieces;
2. Supporting said fruit pieces between an endless chain and a perforated net wherein said net is between said fruit pieces and a plurality of fluid injection nozzles which are directed toward the fruit's exposed pulp;
3. Continuously moving the fruit pieces in a linear path along the net with the endless chain; and
4. injecting fluid from said fluid injection nozzles into said fruit pieces while, said fruit pieces are moving along the net, to separate said pulp and juice from said fruit, said pulp and juice passing through said net.

4,294,862

PROCESS FOR THE PRODUCTION OF PASTRY AND FLAKY PASTRY-LIKE PRODUCTS

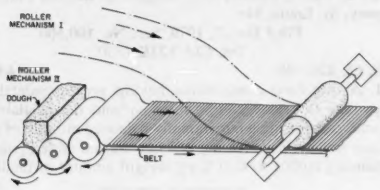
Gerhard Wilke, Holderlinweg 1, 6900 Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 76,994, Sep. 19, 1979, which is a continuation of Ser. No. 873,889, Jan. 31, 1978, abandoned. This application Apr. 10, 1980, Ser. No. 138,849

Int. Cl.[3] A21C *9/08;* **A21D** *13/08*

U.S. Cl. 426—502 **9 Claims**

1. A process for producing pastry and flaky pastry-like products from a starting mixture, comprising subjecting said mixture to rollers arranged in series, each succeeding roller moving faster than the preceding roller, while precisely controlling within a range of 1° C. the temperature of said rollers at a low temperature of 3° C. to 20° C., producing a fleece-like film on the last of said rollers, thereafter conducting said fleece-like film to a belt, including adjusting the ratio of the linear speed of said belt to the rotational speed of said last roller



for imparting a mechanical undulating effect to said fleece-like film, and drying said film.

4,294,863

FLAVORING WITH MIXTURE OF NOR-METHYL JASMONATE AND DIHYDRO-NOR-METHYL JASMONATE

Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Frederick L. Schmitt, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 106,158, Dec. 21, 1979, abandoned. This application Jun. 5, 1980, Ser. No. 156,688

Int. Cl.[3] A23L *1/235*

U.S. Cl. 426—538 **1 Claim**

1. A process for augmenting or enhancing the aroma or taste of a guava flavored foodstuff comprising the step of adding to said foodstuff, from 0.1 up to 0.5 ppm of a mixture of nor-methyl jasmonate and dihydro-nor-methyl jasmonate, the weight ratio of said nor-methyl jasmonate:dihydro-nor-methyl jasmonate being 50:50, produced by the process of hydrogenation or nor-methyl jasmonate in the presence of a hydrogenation catalyst selected from the group of Raney Nickel, Palladium-on-Carbon and Palladium-on-Calcium Carbonate at a temperature in the range of from about 10° C. up to about 100° C.; a hydrogen pressure in the range of from about 5 psig up to about 80 psig, the concentration of catalyst based on the weight of starting material being from about 0.1% up to about 10%.

4,294,864

PREPARATION OF HIGH-RATIO CAKES USING UNTREATED WHEAT FLOUR

Karel Kulp, and William J. Hoover, both of Manhattan, Kans., assignors to The American Institute of Baking, Manhattan, Kans.

Filed Jun. 4, 1979, Ser. No. 45,347

Int. Cl.[3] A21D *10/04*

U.S. Cl. 426—549 **12 Claims**

1. A high-ratio cake batter composition, comprising:

a quantity of wheat flour, said flour being free of treatment, including chlorination and heat treatment, for rendering the flour usable in high-ratio cake batter;

at least about 110% of a sweetening agent;

from about 4 to 35% of protein taken from the group consisting of proteins found in rye, soy, cottonseed, peanut, pea, egg whites, milk, whey, wheat protein concentrate and mixtures thereof; and

from about 5 to 15% of unmodified starch,

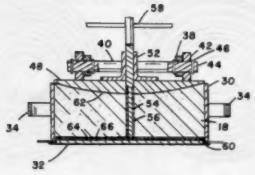
said percentage ranges being stated in terms of flour weight basis wherein the quantity of said wheat flour is taken as 100% by weight.

4,294,865

PROCESS FOR PREPARING BEEF FOR USE ON A VERTICAL ROTISSERIE

James H. Coroncos, 11335 Frederick Rd., West Friendship, Md. 21794

Continuation of Ser. No. 53,580, Jun. 28, 1979, abandoned, which is a division of Ser. No. 917,077, Jun. 19, 1978, Pat. No. 4,245,373. This application Oct. 29, 1980, Ser. No. 203,576
Int. Cl.[3] A23L *1/31*
U.S. Cl. 426—646 10 Claims



1. A process for preparing beef for use on a vertical rotisserie, comprising:

selecting a quantity of beef to be processed from a beef carcass in a blend between very lean beef and partially fat beef;

removing a portion of the fat from those partially fat parts of selected beef;

cutting said beef into small pieces for grinding in a mechanical grinder;

grinding said small pieces of beef in said mechanical grinder and then regrind the ground meat a second time in said mechanical grinder;

preparing a mixture of additive ingredients;

spreading out the ground beef on a wide working surface, and then spreading said additive ingredients evenly over the spread out beef;

kneading the combination of ground beef and additive ingredients until said additive ingredients are thoroughly and evenly mixed throughout the ground beef;

lubricating interior surfaces of beef unit mold and thereafter successively place lifting disc, sheet of beef unit wrapping material, and beef unit mold on base of beef compressing device centered on mold centering section of beef compressing device, said mold interfacing in locating groove in base of beef compressing device, place measured portion of said combination of ground beef and additive ingredients into said mold;

operating beef compressing device to move compressor plate of beef compressing device into said beef unit mold to compress said combination of ground beef and additive ingredients mass into said mold and to compress until substantially all entrapped air is squeezed out of said combination of ground beef and additive ingredients, said compressor plate forming a concave spherically arcurate depression across the uppermost surface of the compressed mass;

placing skewer sleeve on mandrel and insert skewer sleeve and mandrel through guide collar and compressor plate aperture and force combined skewer sleeve and mandrel into compressed meat unit;

removing said mandrel, thereby leaving said skewer sleeve embedded within said compressed meat unit;

operating said compressing device to remove said compressor plate of said compressing device from said mold, thereby permitting said concave spherically arcurate depression across the uppermost surface of the compressed mass to expand to an essentially level configuration;

removing said mold from compressed meat unit;

wrapping meat unit and said skewer sleeve with said wrapping material; and

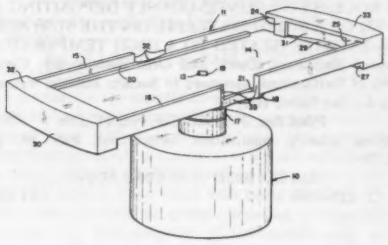
lifting wrapped said meat unit on said lifting disc and place in freezer.

4,294,866

METHOD FOR PRODUCING MONOCELLULAR LAYERS OF CELL-CONTAINING BIOLOGICAL FLUID

Leighton C. Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 6, 1980, Ser. No. 204,564
Int. Cl.[3] B44D *1/02*
U.S. Cl. 427—2 13 Claims



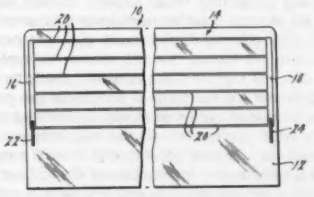
1. A method of producing a monocellular layer of cell-containing biological fluid on a microscope slide or the like, which method comprises the steps of depositing a sample of the fluid on a surface of a microscope slide or the like, inverting said slide so that the sample-bearing surface thereof faces downwardly, and then spinning said slide about a vertical axis normal to said surface.

4,294,867

METHOD FOR DEVELOPING A PATTERN ON A CERAMIC SUBSTRATE

Premakaran T. Boaz, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 15, 1980, Ser. No. 178,416
Int. Cl.[3] B05D *5/12*
U.S. Cl. 427—96 6 Claims



1. A method for developing a pattern on a ceramic substrate, the pattern being formed of a material which is electrically conductive, which method comprises the steps of:

depositing on the ceramic substrate in a desired pattern a thin layer of a heat fusible material which contains a current conducting base metal in granular form;

depositing as an encasing layer over said pattern formed of heat fusible material an oxygen barrier material containing an oxygen getting material, said oxygen barrier material being non-heat fusible and nonreactive with said heat fusible material;

heating in an oxygen containing ambient the ceramic substrate along with said heat fusible material and said oxygen barrier material supported on the ceramic substrate, the heating being to a temperature sufficient to permit said heat fusible material to fuse to the ceramic substrate, said oxygen barrier material protecting said granular, current conducting base metal of said fusible material from oxida-

tion by physically blocking out oxygen and by chemically providing an oxygen getting material which will react with any oxygen which does manage to penetrate into said oxygen barrier material;

cooling the ceramic substrate along with the now fused heat fusible material and any remaining oxygen barrier material supported on the ceramic substrate to room temperature; and

removing any of said remaining oxygen barrier material from the ceramic substrate.

4,294,868

PROCESS FOR CONTINUOUSLY DEPOSITING A LAYER OF A SOLID MATERIAL ON THE SURFACE OF A SUBSTRATE HEATED TO A HIGH TEMPERATURE

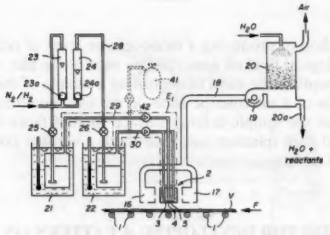
Reinhard Kalbskopf, Onex, and Otto Baumberger, Carouge, both of Switzerland, assignors to Societa Italiana Vetro-Siv-S.p.A., San Salvo, Italy

Filed Jan. 31, 1980, Ser. No. 117,086

Claims priority, application Switzerland, Feb. 14, 1979, 1412/79

Int. Cl.³ B05D *1/34*; C03C *17/245*

U.S. Cl. 427—109 **11 Claims**



1. A process for continuously depositing on the surface of a substrate heated to high temperature a layer of a solid material resulting from the reaction of at least two reactants selected from gaseous reactants and reactants diluted in a gas, which process comprises forming discrete laminar streams of each reactant and projecting these streams on said substrate by bringing the streams together in reciprocal tangential contact, while effecting relative displacement of said streams and the substrate in such a manner that said streams are applied successively to different regions of the substrate, characterised in that each said stream has the form of rectilinear gas curtains, the transverse profile of each said stream converging towards an imaginary edge common to all the said streams, that these curtains and the substrate are disposed in such a manner that said edge is substantially in the plane of the said surface of the substrate, that the said substrate and said curtains are displaced relative to each other in a direction substantially perpendicular to the said common edge in such a manner that the said edge remains substantially in the plane of the said surface of the substrate, that the gases evolving from the reaction which results from the impact of said stream on the substrate are compelled to flow above a predetermined portion of this substrate extending on each side of said edge, and that these gases are evacuated at the extremity of said substrate portion located opposite the said imaginary common edge of said curtains.

4,294,869

METHOD FOR COATING PIPELINE

Christian C. Bassompierre-Sewrin, Embrun, France, assignor to Martech International, Inc., Houston, Tex.

Filed Sep. 26, 1979, Ser. No. 79,181

Int. Cl.³ B05D *3/12*

U.S. Cl. 427—177 **17 Claims**

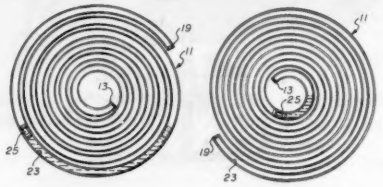
1. In a method for coating an elongate pipeline prior to the laying for inhibiting corrosion wear on the interior thereof comprising the steps of:

reeling the pipeline onto a spool,

installing a pig into the pipeline adjacent a first end thereof and closing that end and also the second end,

introducing coating material into the pipeline between the pig and the second end in sufficient quantity to coat the interior of the pipeline to a predetermined thickness,

rotating the pipeline on its reel in a first direction, and



introducing a sufficient air pressure into the pipeline between the pig and said first end to cause the pig to move through the pipeline in a direction opposite to the direction of rotation, thus causing the interior of the pipeline to be coated with the coating material that is caused to move therethroughout by gravitational force as the pipeline rotates, the pig moving to smooth the coated pipeline surface as it traverses the walls thereof.

4,294,870

METHODS AND DEVICE FOR CLADDING ELONGATED OBJECTS SUCH AS WIRES AND THE LIKE WITH POWDERED MATERIAL

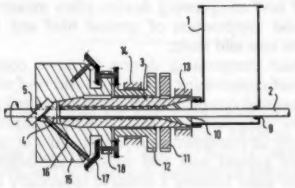
Walter Hufnagl, Loininetstr. 9, 8 Munich, Fed. Rep. of Germany, and Peter Kotaucaek, We. Sperlertz 58, 7030 Wien, Austria

Division of Ser. No. 958,882, Nov. 8, 1978. This application Mar. 31, 1980, Ser. No. 135,623

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1977, 2750369

Int. Cl.³ B05D *3/12*

U.S. Cl. 427—189 **3 Claims**



1. A method of cladding elongated objects such as wires and the like with a powdered material, comprising the steps of sprinkling the object to be clad with the powdered material by passing the object through a storage container; continuously feeding the object in its axial direction through a rotary internal worm conveyor having an outlet provided with a nozzle for continuously applying a layer of powdered material onto the surface of the advancing object during the feeding operation; and roll pressing said applied layer to the surface of the object in its path through a set of pressing rollers, the roll pressing being applied to said layer in a direction forming with said axial direction an acute angle to thereby obtain said elongated object the compacted powdered layer with bonded portions having spiral-like form and overlapping each other.

4,294,871

METHOD FOR DEPOSITING A LAYER ON THE INSIDE OF CAVITIES OF A WORK PIECE

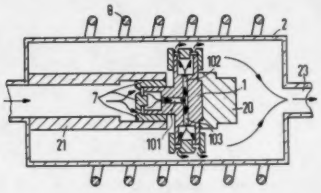
Konrad Hieber, and Manfred Stolz, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 897,349, Apr. 18, 1978, abandoned. This application Aug. 29, 1979, Ser. No. 71,685

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718518

Int. Cl.³ C23C *11/00*

U.S. Cl. 427—237 8 Claims



1. A method for depositing a layer of material of substantially uniform thickness on the inside of cavities of a workpiece having at least two internal cavities of differing inside diameter by chemical deposition from the gaseous phase, comprising heating the parts of said workpiece to be provided with said layer; conducting a gas stream containing the components of the material to be deposited along the surface of said parts in a substantially laminar flow by provision of a flow profiler at least approximately fitted to the shape of the workpiece and precipitation of said material from the gaseous phase at a pressure of less than 10^4 N/m^2, whereby said flow profiler is designed and fitted to said workpiece so as to cause said gas stream to flow uniformly past the parts of said workpiece and to cause the resistance to flow of said gas stream from each of said individual internal cavities to be of approximately the same magnitude.

4,294,872

METHOD AND AN APPARATUS FOR COATING A WEB WITH A COATING COMPOSITION

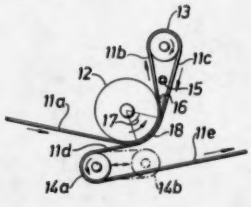
Mats O. Kullander, Säffle, Sweden, assignor to Billerud Uddeholm AB, Säffle, Sweden

Filed Mar. 21, 1980, Ser. No. 132,792

Claims priority, application Sweden, Sep. 22, 1978, 7809998

Int. Cl.³ B05D *3/12;* B05C *3/02, 3/12*

U.S. Cl. 427—358 13 Claims



1. A method of coating a continuously conveyed web with a coating composition, comprising the steps of:

applying a coating composition in excess to a first zone of the continuously conveyed web;

providing a backing support for one of the first zone and a second, uncoated zone of the web; and

deflecting the other of the first and second zones of the web into contact with said one zone without providing a backing support for said other zone, to thereby form a contact zone such that the uncoated second zone of the web wipes excess coating composition from the coated first zone of the web.

4,294,873

MANUFACTURE OF PAPER HAVING A HIGH DRY STRENGTH AND A LOW WET STRENGTH

Juergen Hartmann, Ludwigshafen; Joachim Stedefeder, Lampertheim; Walter Denzinger, and Sigberg Pfohl, both of Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 3, 1980, Ser. No. 109,315

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1979, 2903218

Int. Cl.³ B05D *3/02;* B32B *23/08, 27/10*

U.S. Cl. 427—391 5 Claims

1. A process for the manufacture of paper having a high dry strength and a low wet strength which comprises treating the surface of paper with an aqueous solution of a water-soluble alkaline earth metal salt or a mixture of a water-soluble alkaline earth metal salt and an alkali metal salt, the ratio of alkaline earth metal salts to alkali metal salts being 30–50:70–50, of a polymer selected from the group consisting of homopolymer of acrylic acid, homopolymer of methacrylic acid, acrylic acid/acrylamide copolymer, acrylic acid/acrylonitrile copolymer, acrylic acid/methacrylic acid/acrylamide copolymer and acrylic acid/acrylamide/methacrylamide copolymer;

which has a viscosity of from 5 to 100 mPas (measured in a Brookfield viscometer at 20 revolutions per minute) in 2% by wt. strength aqueous solution at 20° C., and drying the paper.

4,294,874

SILICATE-CONTAINING LATEX COATING COMPOSITIONS

Mark J. Howe, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 23, 1979, Ser. No. 59,825

Int. Cl.³ B05D *1/18, 3/02*

U.S. Cl. 427—393 9 Claims

1. A method of filling wood or a wood-like product, comprising the steps of:

(a) applying a latex composition to the wood or wood-like product wherein the composition has a film-forming solids content of at least about 2.5 percent and consists essentially of:

(1) an alkali metal silicate, and

(2) a synthetic polymeric latex selected from the group consisting of styrene-butadiene copolymers, vinyl chloride-alkylene copolymers and mixtures thereof,

wherein, as film-forming solids, the silicate is present in an amount of from about 15 percent to about 40 percent and the latex is present in an amount of from about 60 percent to about 85 percent; and

(b) drying the coated product of step (a) so as to remove water and cure the composition to produce the filled wood or wood-like product.

4,294,875

INSULATION PANEL

Arthur G. Schramm, 8780 E. McKellips Rd., Space 125, Scottsdale, Ariz. 85257

Continuation-in-part of Ser. No. 937,266, Aug. 31, 1978, abandoned. This application Apr. 3, 1979, Ser. No. 26,668

Int. Cl.³ B32B *3/12*

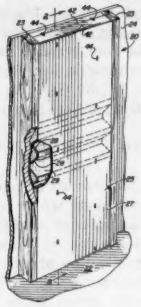
U.S. Cl. 428—72 4 Claims

1. The thermal insulation structure comprising:

a front sheet, a back sheet, a pair of side sheets, a top sheet and a bottom sheet forming an envelope defining a space which is substantially a rectangular parallelepiped, said front, back and side sheets having a length and a width, the length of said front, back and side sheets being substan-

tially equal, the width of the front and back sheets being substantially greater than the width of the side sheets;

substantially rigid panel means having edges mounted in said space for dividing said space into a plurality of substantially regular equilateral triangular prismatic closed compartments having lateral edges defined by said rigid panel



means, edges of said rigid panel means defining lateral edges of said compartments and being secured to the front and back sheets of said envelope, said lateral edges of the compartments being substantially perpendicular to the side sheets; and

a plurality of individual granules of a cellulose material substantially filling said compartments.

4,294,876

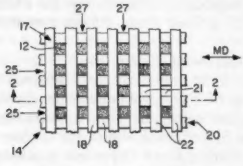
TUFTED MATERIAL HAVING A LAMINATED FILM PRIMARY TUFTING SUBSTRATE

James B. Camden, Newcastle Upon Tyne, England, and Kenneth D. Vinson, Bartlett, Tenn., assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 34,059, Apr. 27, 1979, abandoned. This application May 1, 1980, Ser. No. 145,414

Int. Cl.³ B32B *27/16*

U.S. Cl. 428—95 **7 Claims**



1. A tufted material comprising:

(a) tuft strand elements arranged in substantially orthogonally related sets of rows, and

(b) a primary tufting substrate having needle holes therethrough and through which said tuft strand elements extend, said substrate comprising a bonded laminate having a plurality of layers of nonwoven materials, including two oppositely disposed surface layers, said substrate comprising first and second layers of uniaxially molecularly oriented polymeric material of substantially uniform thickness, each of said first and second layers having been drawn sufficiently to induce splitting parallel to its direction of molecular orientation upon penetration, said layers being split on both sides of each of the needle holes whereby each pair of adjacent rows of tuft portions in a direction which is parallel to the molecular orientation of one of said layers defines an elongate segment of primary tufting substrate in the layer, said segment being substantially uninterrupted between the adjacent pair of rows of tuft portions,

(1) said first layer located intermediate said surface layers and having the direction of molecular orientation thereof parallel to the tufting machine direction,

(2) said second layer having the direction of molecular orientation substantially at right angles to that of said first layer,

(3) said surface layers of said bonded laminate being made of materials other than uniaxially molecularly oriented polymeric material having a direction of molecular orientation which is parallel to the tufting machine direction.

4,294,877

EPOXY IMIDE COMPOSITIONS

William F. Graham, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

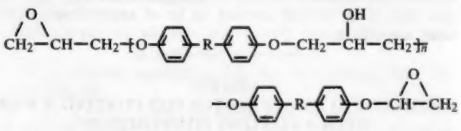
Division of Ser. No. 27,444, Apr. 5, 1979, which is a continuation-in-part of Ser. No. 848,638, Nov. 4, 1977, abandoned. This application Jun. 6, 1980, Ser. No. 157,454

Int. Cl.³ C08L *63/00;* **B32B** *15/14, 27/04*

U.S. Cl. 428—209 **18 Claims**

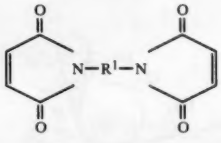
1. A product comprising a fibrous substrate impregnated with a composition comprising 20–80% by weight of a reaction product and 20–80% of a nonamide solvent for the reaction product having a dispersion solubility parameter of 7.2–10.5, a polar solubility parameter of 3–9.5 and a hydrogen bonding solubility parameter of 0–5.5; wherein the reaction product consists essentially of

(a) an epoxy resin of the formula



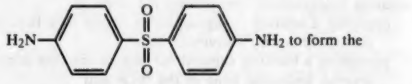
wherein R is an alkylene group of 1–4 carbon atoms, n is a positive integer; and the resin having an epoxide equivalent of about 150–1000; and

(b) a bismaleimide of the formula



wherein (a) and (b) are reacted at 115°–135° C. for about 0.5–2 hours and subsequently contacting the product of (a) and (b) with

(c) a diamine of the formula



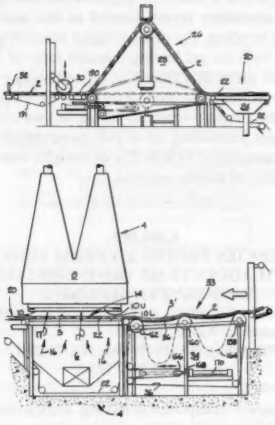
reaction product; wherein the molar ratio of bismaleimide to diamine is about 0.6–0.8.

4,294,878

PROCESS FOR RAPID ANNEALING OF REFRACTORY FIBER BODIES AND LAMINATED BODY PRODUCED BY PROCESS

Richard N. Cunningham, Littleton, Colo., and Romain E. Loeffler, deceased, late of Littleton, Colo. (by Carolyn R. Loeffler, personal representative), assignors to Johns-Manville Corporation, Denver, Colo.

Filed Sep. 7, 1979, Ser. No. 73,412
Int. Cl.[3] B32B *7/02*
U.S. Cl. 428—212 15 Claims



1. A process for annealing of a body of refractory fiber which comprises passing air at a temperature in the range of from about 750° F. to about 1400° F. through said body for a period of from about 5 to about 200 seconds while maintaining said body with a predetermined dimension in the direction of air flow.

4,294,879

FIBROUS INSULATION MAT WITH ANTI-PUNKING BINDER SYSTEM

Patricia A. McHenry, Denver, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Dec. 4, 1980, Ser. No. 212,928
Int. Cl.[3] D04H *1/58*
U.S. Cl. 428—288 5 Claims

1. Fibrous insulation comprising a mass of glass fibers bonded with a binder system in an amount which lies between about 1 to 20% loss-on-ignition, said binder comprising a water soluble phenolicformaldehyde resin mixed with a water soluble urea-formaldehyde resin, the urea-formaldehyde resin content in said binder system comprising an amount of about 5 to 50% by weight of the binder solids content, said urea-formaldehyde resin comprising about 59% urea, about 19% formaldehyde and about 22% water by weight.

4,294,880

FOAMED POLYURETHANE ARTICLES WITH SKIN AND A METHOD FOR PRODUCING THE SAME

Masazo Nishida, Toyota, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Aug. 10, 1979, Ser. No. 65,748
Claims priority, application Japan, Aug. 11, 1978, 53/98446
Int. Cl.[3] B29D *27/04*
U.S. Cl. 428—315 7 Claims

1. A method of producing a molded polyurethane article having a foamed polyurethane core member and a polyurethane surface skin layer formed as an integral unit, consisting essentially of the steps of spraying the inner surface of a foaming mold with a polyurethane composition to prepare a surface skin layer in the mold, pouring a foamable polyurethane solution into said mold and causing the polyurethane to foam and cure, thereby forming said integral unit, wherein the polyurethane composition used for the polyurethane surface skin layer is a two-part system consisting of (1) an organic polyisocyanate, and (2) polyols mixed with an aliphatic or equivalent aliphatic aromatic primary diamine in which the amino groups are attached to an aliphatic side chain, whereby in advance of the formation of the surface skin layer, an initial reaction product of said organic polyisocyanate and said aliphatic or equivalent aliphatic aromatic primary diamine having thixotropic properties is caused to be formed on the inner surface of the foaming mold; said reaction product being formed during the spray operation in which said two component polyurethane system is sprayed from a spray-coating apparatus used for two-component spraying and whereby the reaction product is formed in the mixing chamber.

7. A molded polyurethane article having an inner foamed polyurethane core member and a polyurethane surface skin layer of a uniform thickness produced by the method of claims 1 or 2.

4,294,881

COATED GLASS ARTICLE

John H. Meyer, Milford, and Salvatore Guerra, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 2, 1980, Ser. No. 165,427
Int. Cl.[3] B32B *17/06, 27/20, 27/30*
U.S. Cl. 428—334 12 Claims

1. As an article of manufacture having transmission capabilites above 70%;

a glass substrate having at least first and second surfaces;

a coating on at least a portion of one surface of said glass substrate, said coating having a thickness in a range from about 70 angstroms to about 120 angstroms, said coating consisting, on a mixed metal oxide weight basis, of about 60 to 70% cobalt, 12 to 18% chromium, and 16 to 24% iron; and

a protective layer over said coating.

5. As an article of manufacture having transmission capabilities above 70%;

a glass substrate having at least first and second surfaces

a coating on at least a portion of one surface of said glass substrate, said coating having a thickness in a range from about 75 angstroms to about 110 angstroms, said coating consisting, on a mixed metal oxide weight basis, of about 63 to 68% cobalt, 14 to 16% chromium, and 17 to 20% iron; and

a protective layer over said coating.

9. As an article of manufacture having transmission capabilities above 70%;

a glass substrate having at least first and second surfaces;

a coating on at least a portion of one surface of said glass substrate, said coating having a thickness in a range from about 80 angstroms to about 100 angstroms, said coating consisting, on a mixed metal oxide weight basis, of about 65 to 66% cobalt, 14.5 to 15.5% chromium, and 18.5 to 19.5% iron; and

a protective layer over said coating.

4,294,882

HEAT-SEALABLE ANTISTATIC POLYPROPYLENE FILMS

William J. Andrews, Taunton; David J. C. Espley, and William J. M. Philpott, both of Bridgewater, all of England, assignors to British Cellophane Limited, Somerset, England

Filed Aug. 23, 1979, Ser. No. 69,089

Claims priority, application United Kingdom, Sep. 19, 1978, 37295/78

Int. Cl.[3] B32B *27/08;* B29C *19/00;* B32B *27/00*

U.S. Cl. 428—349 17 Claims

1. A method for the manufacture of an oriented heat-sealable antistatic polypropylene film comprising applying to one or both sides of a base polypropylene film a layer of a heat-sealable olefinic polymer capable of forming a heat-seal below 140° C., the olefinic polymer layer containing between 0.2 and 10% by weight of an antistatic agent comprising an anionic hydrocarbyl sulphonate, and stretching the combination in one or more directions under stretch orientatable conditions.

12. An oriented heat-sealable antistatic polypropylene film comprising a base polypropylene film having on one or both surfaces a layer of an olefinic polymer capable of forming a heat-seal below 140° C., the olefinic polymer layer containing between 0.2 and 10% by weight of an antistatic agent comprising an anionic hydrocarbyl sulphonate.

4,294,883

STAPLE FIBER, FINISH THEREFOR AND PROCESS FOR USE OF SAME

Roland L. Hawkins, Spartanburg, S.C., assignor to Hoechst Fibers Industries, Div. of American Hoechst Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 715,719, Aug. 19, 1976, Pat. No. 4,179,543. This application Aug. 17, 1979, Ser. No. 67,294

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.[3] D02G *3/00*

U.S. Cl. 428—361 7 Claims

1. A synthetic polymeric staple fiber, said fiber having a length in a range of from about ¼ to about 3 inches and having a finish thereon comprising:

(a) an ethoxylated primary emulsifier containing at least five moles of ethylene oxide and having a surface tension of at least 30 dynes per centimeter in a 0.10 weight percent aqueous solution of same at about 25 degrees Centigrade; p0 (b) a lubricant for said fiber;

(c) a secondary emulsifier for said lubricant, said secondary emulsifier being compatible with said primary emulsifier; and

(d) an anionic constituent, said finish being present on the fiber in an amount of at least 0.1 percent based on fiber weight and exhibiting a low foaming propensity and being conducive to good fiber bondability in the presence of a chemical binder.

4,294,884

ACRYLIC FIBER HAVING IMPROVED BASIC DYEABILITY AND METHOD FOR MAKING THE SAME

Hartwig C. Bach, and Helmuth E. Hinderer, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 6, 1980, Ser. No. 157,128

Int. Cl.[3] D02G *3/00*

U.S. Cl. 428—364 3 Claims

1. A wet spun fiber composed of an acrylic polymer formed from monomers at least one of which is a sulfonated vinyl monomer, wherein said polymer contains 0.5 to 25 weight percent of an additive polymer dispersed therein, said additive polymer being selected from the group consisting of cellulose triacetate, polymethyl methacrylate, polyvinyl chloride, a polyamide of hexamethylenediamine with 1,1,3-trimethyl-5-carboxy-3-(p-carboxyphenyl) indane and a polyamide of hexamethylenediamine with isophthalic acid.

4,294,885

SURFACE-MODIFIED PIGMENT OF NATURAL KAOLIN MATERIAL AND A PROCESS OF PRODUCING SAME

Olof Sunden, Lidingö, Sweden, assignor to EKA AB, Surte, Sweden

Filed May 14, 1980, Ser. No. 149,769

Claims priority, application Sweden, Jun. 1, 1979, 7904814

Int. Cl.[3] B32B *5/16, 9/00*

U.S. Cl. 428—404 5 Claims

1. A surface-modified pigment of natural kaolin material intended for use as a pigment in paper and coats of paint, characterised in that it has on its pigment particles precipitated primary and secondary layers bonded to one another by hydrogen or ion bonding, the primary layer consisting of anionic Al_2O_3—SiO_2 hydrate gel having a molar ratio of SiO_2:Al_2O_3 of from 3 to 30, preferably from 8 to 15, and being present in an amount corresponding to from 2 to 15% by weight of SiO_2, based upon the original quantity of kaolin material, and the secondary layer consisting of a polymeric binder which is included in a quantity of at least 2% by weight, based upon the original quantity of kaolin material.

4,294,886

TRANSPARENCIES PRODUCED FROM EPOXY RESINS CURED WITH ADDUCTS OF TRIMETHOXYBOROXINE AND BENZYL ALCOHOL

John R. Uram, Jr., Glendale, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Aug. 28, 1979, Ser. No. 70,390

Int. Cl.[3] C08G *59/40*

U.S. Cl. 428—412 11 Claims

1. A transparent composition having resistance to intense heat, comprising:

a transparent blend having (a) from 80 parts to about 100 parts of an epoxy resin;

(b) from 7.5 parts to about 30 parts of trimethoxyboroxine; and

(c) from 1 part to about 10 parts of a phenyl substituted alkyl alcohol.

4,294,887

PRODUCTION OF COATING FILMS FROM AUTOXIDIZABLE MATERIALS AND COATING COMPOSITIONS CAPABLE OF PRODUCING SUCH FILMS

Peter F. Nicks, Maidenhead, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sep. 18, 1979, Ser. No. 76,726

Claims priority, application United Kingdom, Sep. 27, 1978, 38332/78

Int. Cl.[3] B32B *27/40*

U.S. Cl. 428—423.1 11 Claims

1. A method of preparing a cured coating film by applying to a substrate a liquid coating which is free from metal catalyst and which comprises

(a) a film-forming material comprising moieties of an ethylenically unsaturated fatty acid containing at least two ethylenically unsaturated groups, said film-forming material being selected from the group consisting of oil-modified alkyd resins, oil-modified addition polymers of ethylenically unsaturated monomers, epoxy esters of ethylenically unsaturated fatty acids, oil-modified polyurethane oils and oil-modified polyurethane alkyds, and

(b) an acid which is fully dissociated when in the presence of water, said acid being selected from the group consisting of a sulphonic acid, hydrochloric acid and sulphuric acid,

and thereafter exposing the coating to oxygen until fully cured, the acid functioning to catalyze autoxidation of component (a).

10. A cured coating film prepared by the method of claim 1, said film being supported on a substrate.

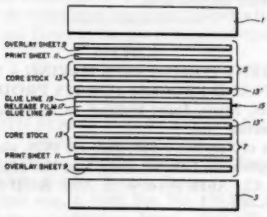
4,294,888
RELEASE MEDIUM HAVING TRANSFERRABLE GLUE LINES

Christo Antonio, Princeton, and Wyman F. Uhl, Sterling, both of Mass., assignors to Litton Business Systems, Inc., New York, N.Y.

Continuation of Ser. No. 922,191, Jul. 5, 1978, abandoned, which is a continuation of Ser. No. 780,850, Mar. 24, 1977, abandoned, which is a division of Ser. No. 521,054, Nov. 5, 1974, Pat. No. 4,030,955. This application Apr. 24, 1979, Ser. No. 32,759

Int. Cl.³ B32B *27/08, 27/30*

U.S. Cl. 428—451 **4 Claims**



1. A release medium adapted to separate laminates during heat and pressure consolidation comprising a self-sustaining film material which will not soften or become tacky during said heat and pressure consolidation, said film material having its opposite surfaces coated with a glue adherable layer containing at least 40% polyvinyl alcohol on a dry solid basis and positionable between the backmost surfaces of the laminates, said polyvinyl alcohol being water insolubilized, said glude adherable layers being transferable to the backmost surfaces of said laminates during consolidation of said laminates.

4,294,889
RESIN COMPOSITIONS AND HEAT-SEALABLE COMPOSITE BIAXIALLY-STRETCHED FILMS

Fukashi Hashimoto, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1979, Ser. No. 24,673

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—515 **9 Claims**

1. A biaxially-stretched polypropylene composite film comprising a biaxially-stretched film of a crystalline polypropylene and a monoaxially-stretched or biaxially-stretched film of a resin composition bonded in laminated state to at least one surface of the crystalline polypropylene film, the resin composition comprising:

from 96 to 50 percent of a propylene copolymer (a), which is a member selected from the group consisting of

(a_1) ethylene-propylene random copolymers each of an ethylene component content of 1.5 to 10 percent,

(a_2) ethylene-propylene-butene-1 random copolymers each of an ethylene component content of 0 to 5 percent, a butene-1 component content of 8 to 30 percent, and a propylene component content of 92 to 65 percent, and

from 3 to 30 percent of a polybutene-1- (b); and

from 1 to 20 percent of an ethylene-propylene-butene-1 random random copolymer (c) of a propylene component content of 0.5 to 3 percent and a butene-1-component content of 2 to 10 percent, of a density of 0.915 to 0.935 g./cm.^{3}, and of a melting point of 115° to 125° C.,

all quantities expressed in percent being by weight, and in which the melt flow rate of said propylene copolymer (a) is about 1 to 30 g./10 min., the melt flow rate of said polybutene-1 (b) is about 5 to 50 g./10 min. and the melt flow rate of said ethylene-propylene-butene-1 copolymer (c) is about 2 to 50 g./10 min., with the proviso that at 180°-300° C. the melt flow rate of propylene copolymer (a) is equal to or less than those of polybutene-1 (b) and ethylene copolymer (c).

4,294,890
METHOD FOR PREVENTING REFLECTION

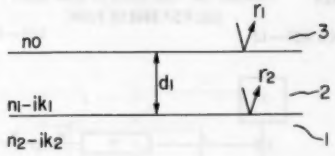
Susumu Ito, Tokyo; Noboru Sugawara, Sagamihara, and Sayoko Amano, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 15,655, Feb. 27, 1979, abandoned, which is a continuation of Ser. No. 856,734, Dec. 1, 1977, abandoned, which is a continuation of Ser. No. 641,265, Dec. 16, 1975, abandoned. This application Dec. 10, 1979, Ser. No. 102,312

Claims priority, application Japan, Dec. 23, 1974, 49/147843

Int. Cl.³ B32B *15/20, 15/04;* **C23C** *13/02, 13/04*

U.S. Cl. 428—641 **7 Claims**



1. A coating having anti-reflection characteristics within a visible range, comprising:

an aluminum layer vapor-deposited on a substrate to a film thickness preventing the transmission of light therethrough under a pressure of 2×10^{-5} Torr. or below, and

a silicon layer having a film thickness of the order of 300 A vapor-deposited on said aluminum layer under a pressure of 2×10^{-5} Torr. or below.

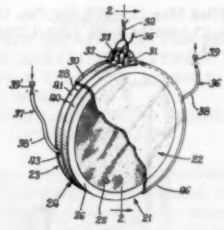
4,294,891
INTERMITTENTLY REFUELABLE IMPLANTABLE BIO-OXIDANT FUEL CELL

Shang J. Yao; Huei Y. Sun Yao, both of Upper St. Clair, and Sidney K. Wolfson, Jr., Fox Chapel, all of Pa., assignors to The Montefiore Hospital Association of Western Pennsylvania, Pittsburgh, Pa.

Filed Mar. 12, 1980, Ser. No. 129,709

Int. Cl.³ H01M *8/16*

U.S. Cl. 429—2 **14 Claims**



1. A biologically acceptable, implantable, bio-oxidant fuel cell comprising in operative combination:

(a) at least one anode assembly;

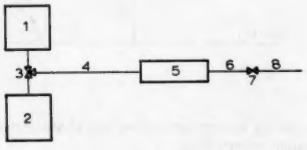
(b) at least one cathode assembly;
(c) a fuel/electrolyte chamber defined between said anode and said cathode assemblies for receiving an externally supplied fuel;
(d) an electrical lead attached to each of said anode and cathode assembly to provide electrical output to a prosthesis;
(e) a biologically acceptable, oxygen permeable membrane disposed substantially in contact with said cathode assembly so that said membrane lies between said cathode and body tissue, said membrane being adapted to permit endogenous tissue O_2 as a biological oxidant to diffuse into said cell from said body tissue;
(f) a fuel/electrolyte composition disposed in said fuel/electrolyte chamber; and
(g) said fuel/electrolyte composition having a high concentration ratio of fuel to endogenous tissue O_2 diffusing through said membrane into said cell.

4,294,892

METHOD FOR THE OPERATION OF A FUEL CELL

Marinus Alfenaar, Schinnen, Netherlands, assignor to Electrochemische Energieconversie, N.V., Mol, Belgium

Filed May 1, 1980, Ser. No. 145,843
Claims priority, application Netherlands, May 2, 1979, 7903426
Int. Cl.³ H01M *8/04*
U.S. Cl. 429—13 **12 Claims**



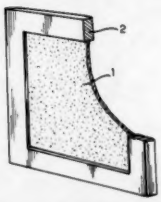
1. A method for operating a fuel cell with a porous gas diffusion electrode to which an oxidizing or reducing gas is fed, wherein the concentration level of the oxidizing or reducing gas, calculated as molecular oxygen or hydrogen respectively, in the gas phase in situ of the electrode in question is temporarily brought to a reduced level the terminal voltage being reduced to below 10% of its original value, the overall pressure of the gas phase in situ of this electrode being substantially maintained and the power offtake is continued for at least the period during which the concentration level is reduced.

4,294,893

GRAPHITE-RESIN COMPOSITE ELECTRODE STRUCTURE, AND A PROCESS FOR ITS MANUFACTURE

Giuliano Iemmi, Turin, and Diego Macerata, Pinerolo, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed May 21, 1979, Ser. No. 41,050
Int. Cl.³ H01M *4/96, 4/62;* C25B *11/12*
U.S. Cl. 429—42 **2 Claims**



1. A press-formed fuel cell electrode comprising an electrically conductive porous plate portion contoured by an electrically conductive compact carrier frame portion integral with said plate portion, the structure of each of said portions being formed by resin-bonded particles of a conductive carbon, the bonding resin being a cross-linked polyimide resin in an amount of 15–50% while the carbon particles are correspondingly in an amount of 85–50% on the joint weight of the carbon particles and resin, and wherein the porous plate portion has been obtained by a process comprising pressing at cross-linking temperature a particulate mixture of (a) particles of a prepolymer of said polyimide resin filled with said carbon particles and (ii) particles of a pore-forming agent removable by volatilization or leaching, one face of the porous plate portion being coated with sintered particles of polytetrafluoroethylene rendering said face hydrophobic.

4,294,894

TRANSPARENT TOOTHPASTE HAVING A MEDICINAL ACTION AND PROCESS FOR ITS PRODUCTION

Enzo Vellucci, Rome, Italy, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 3,565, Jan. 15, 1979, abandoned. This application Feb. 15, 1980, Ser. No. 121,933
Int. Cl.³ A61K *9/16, 9/18, 7/22;* B65D *81/24*
U.S. Cl. 424—49 **14 Claims**

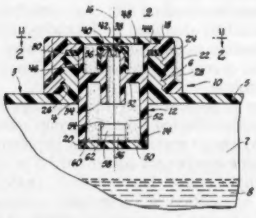
1. A process for the preparation of a toothpaste which comprises:
(a) preparing under heat a gelled basic mass comprising a gel, and a polyglycolic vehicle;
(b) adding to said gelled mass, while heating, de-ionized water containing buffer and then sodium chloride as a saline electrolyte in amounts ranging from 0.5 to 20% by weight of the entire toothpaste composition;
(c) cooling said mixture from (b) and adding thereto de-ionized water, silica thickening compound and amorphous silica gel, which is in finely divided form and has an average particle size ranging from about 2 to about 20 microns and a surfacial development of within the range of from 600 to 800 m^2/g, in amounts ranging from 5 to 50% by weight with respect to the entire toothpaste composition, and stirring until a uniform single phase is attained, and
(d) cooling to room temperature, deaerating until a uniform transparent paste is free from clouds and bubbles to obtain said toothpaste and packaging it in unlined aluminum tubes.

4,294,895

BATTERY VENT CAP FOR PREVENTING ELECTROLYTE FOAM ESCAPE

Larry P. Atkins, Daleville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 10, 1980, Ser. No. 168,276
Int. Cl.³ H01M *2/12*
U.S. Cl. 429—84 **5 Claims**



1. A vent device for releasing gases formed in a battery container while preventing the escape of electrolyte that may be carried with the gas in the form of foam, said vent device comprising;
a housing comprising a cylindrical side wall and transverse

walls defining a compartment, said housing being adapted to be vertically mounted in the container such that the then lower transverse wall lies inside the container,

a gas passage adapted for venting the compartment to outside the container,

at least one opening in the housing side wall spaced apart from the lower transverse wall and adapted to connect the compartment to inside the container for admitting gases and foam, and

a reservoir within the compartment between the opening and the lower end wall and containing an antifoam agent, said reservoir, gas passage and opening defining a gas-foam flow path through the compartment such that foam entering the compartment through the opening spills into the reservoir whereupon the agent dissipates the foam and foam-free gas flows to the gas passage unimpeded by the agent.

4,294,896

BATTERY WITH FLAME INTERCEPTING FILTER AND GROUNDING LEAD

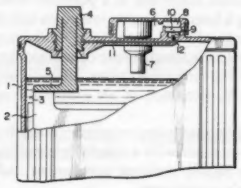
Masahiro Ueda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Aug. 8, 1980, Ser. No. 176,349

Claims priority, application Japan, Aug. 29, 1979, 54-119576[U]

Int. Cl.³ H01M *2/12*

U.S. Cl. 429—86 **9 Claims**



1. An electrical storage battery, comprising;

a battery casing formed with a gas venting exhaust passage which communicates the interior of the battery casing to the exterior thereof;

a flame intercepting filter located at an intermediate portion of the gas venting exhaust passage and extending thereacross so as to define a passage portion on the exterior side of the flame intercepting filter;

and a means for substantially electrically grounding in the vicinity of a part of said exterior side passage portion.

4,294,897

SEALING OF CERAMIC ELECTROLYTE TUBES IN ELECTROCHEMICAL CELLS

Peter J. Bindin, Runcorn, England, assignor to Chloride Silent Power Limited, London, England

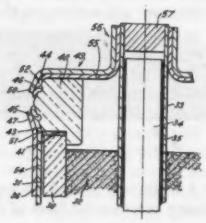
Division of Ser. No. 902,528, May 3, 1978, Pat. No. 4,215,466. This application Mar. 25, 1980, Ser. No. 133,723

Claims priority, application United Kingdom, May 5, 1977, 18870/77

Int. Cl.³ H01M *2/08*

U.S. Cl. 429—104 **12 Claims**

1. An electrochemical cell having a ceramic electrolyte tube closed at one end and separating anodic and cathodic reactants, wherein an annular element of ceramic material is sealed with glass to the open end of the electrolyte tube, said annular element having shaped external surfaces such that, over these surfaces, the diameter of the element decreases from a maximum diameter intermediate the ends of the element to minimum diameters at or near the respective ends of the element, soft metal over said shaped surfaces and outer metal elements around said shaped surfaces and secured thereto by the soft metal, one of said metal elements forming part of a housing enclosing the electrolyte tube and the other of the metal elements forming a top closure extending at least partly across the top of said annular ceramic element.



4,294,898

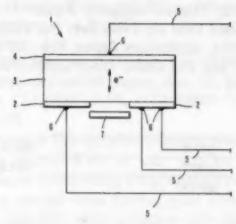
SOLID STATE BATTERY

Allan M. Hartstein, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 5, 1980, Ser. No. 146,965

Int. Cl.³ H01M *6/18*

U.S. Cl. 429—104 **8 Claims**



1. A solid state rechargeable battery comprising at least three layers including a first layer consisting essentially of an alkali metal-containing electrode in the solid state, a second solid electrolyte layer adjacent said first layer, and a third layer adjacent said second solid electrolyte layer consisting essentially of intercalation graphite adapted to accept ions of the alkali metal from the first layer, wherein said third layer is free from materials which interface to an undesirable extent with the ability of the graphite to intercalate the ions of said alkali metal therein, and wherein the C-axis of the solid electrolyte and at least a portion of the C-axis of said graphite layer are perpendicular to the flow of the alkali metal ions in the battery.

4,294,899

PTFE-BOUND TALC SEPARATORS FOR SECONDARY ZINC ALKALINE BATTERIES

Romeo R. Witherspoon, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

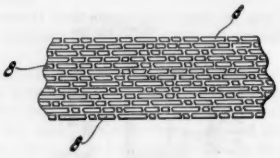
Filed May 1, 1980, Ser. No. 145,595

Int. Cl.³ H01M *2/16*

U.S. Cl. 429—206 **5 Claims**

1. A secondary zinc alkaline battery comprising a zinc electrode, a counterelectrode and a microporous separator between said electrodes for preventing zinc dendrite bridging between said electrodes, said separator having a first face adjacent said zinc electrode and a second face adjacent said counterelectrode and comprising a multiplicity of overlapping talc platelets randomly distributed throughout a fibrillated polytetrafluoroethylene binder, said platelets being oriented

such that the face of the platelets substantially parallel the faces of the separator and being microspaced one from the other



such as to define a tortuously-pathed network of interconnected pores extending between the faces of said separator.

4,294,900

PROCESS OF PRODUCING MULTICOLOR OPTICAL FILTERS

Toshiaki Aono, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 22, 1980, Ser. No. 123,610
Claims priority, application Japan, Feb. 23, 1979, 54-20265
Int. Cl.³ G03C *7/00*; G03F *5/00*
U.S. Cl. 430—7 **8 Claims**

Cp(C)-M	EMULSION LAYER (2)
Cp(M)-Y	EMULSION LAYER (1)
SUPPORT	

1. A process of producing a multicolor optical filter which comprises:

exposing a multilayer color photographic material comprising: **(1)** a silver halide emulsion layer containing a colored coupler **(1*b*)** colored cyan, magenta or yellow and forming a dye having one of the other two principal colors by coupling reaction with the oxidation product of an aromatic primary amine color developing agent, and **(2)** a silver halide emulsion layer **(2)** containing a silver halide emulsion **(2*a*)** having a sufficiently high sensitivity that upon exposure that does not produce an image in emulsion layer **(1)** upon development, an image is produced in emulsion layer **(2)** and containing a colored coupler **(2*b*)** having the same color as that of the dye formed by the coupling reaction of the colored coupler **(1*b*)** in emulsion layer **(1)** and forming a cyan, magenta or yellow dye other than the color of the colored coupler **(1*b*)** or the color of the dye formed by coupling reaction of the colored coupler **(1*b*)**;

said exposure being such that a portion of the material is unexposed and no image-wise development occurs in the silver halide emulsion layer **(1)** or **(2)**, a portion is exposed in an amount sufficient to increase the coupling color density of the silver halide emulsion layer **(2)** and no image-wise development occurs in silver halide emulsion layer **(1)**, and the remaining portion is exposed in an amount sufficient to produce image-wise development of the silver halide emulsion layer **(1)**; and

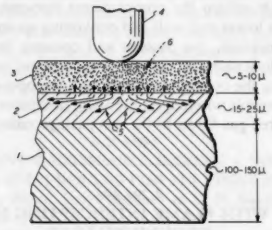
processing the color photographic material in color developer containing an aromatic primary amine color developing agent.

4,294,901

THERMOREMANENT MAGNETIC IMAGING MEMBER AND SYSTEM

Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 3, 1980, Ser. No. 203,207
Int. Cl.³ G03G *19/00*
U.S. Cl. 430—39 **10 Claims**



1. A magnetic imaging process comprising:

(a) providing a thermoremanent magnetic imaging member comprising a substrate, an electrically conductive layer over said substrate, and an electrically resistive layer over said conductive layer wherein said resistive layer comprises aligned magnetic particles and electrically conductive particles dispersed in a polymer binder;

(b) forming a latent magnetic image on said imaging member by heating selected portions of said imaging member to about the Curie temperature of said magnetic particles and allowing the heated portions of said imaging member to cool in the presence of an externally applied magnetic field;

(c) developing said latent magnetic image by contacting said imaging member with a magnetic toner composition comprising a fusible resinous component and a magnetically attractable component;

(d) transferring the developed image to a receiving member; and

(e) fixing the transferred image to said receiving member.

4,294,902

IMAGE FORMATION METHOD HAVING TRANSLUCENT PARTICLES CONTAINING A COLORING AGENT AND A COLORLESS DYE FORMER

Yuji Takashima, Osaka; Eisuke Ishida, Nara; Hisanori Nishiguchi, Neyagawa, and Kimiaki Yoshino, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 741,022, Nov. 11, 1976, abandoned.
This application Aug. 17, 1978, Ser. No. 934,503
Claims priority, application Japan, Nov. 12, 1975, 50-136505; Nov. 12, 1975, 50-136506; Nov. 12, 1975, 50-136507
Int. Cl.³ G03G *13/08, 13/16*
U.S. Cl. 430—45 **10 Claims**

1. Image formation method comprising steps of:

a. imparting a charge to a photoconductive member combined with an electrically conductive support member;

b. spreading on the surface of the charged photoconductive member a mixture of particles comprising at least one type of non-photoconductive, translucent particles containing a coloring agent and a colorless dye which is capable of developing a color different from that transmitted by said translucent particles;

c. causing said translucent particles to electrostantially adhere to said surface through electrostatic attraction;

d. subjecting the charged photoconductive member bearing said translucent particles to light image exposure through said translucent particles, thereby selectively weakening and attenuating the charge on a portion of said photocon-

ductive member below said translucent particles through which the light of said light image has passed, whereby the electrostatic attraction of said particles to said photoconductive member is selectively weakened in relation to the degree of said light exposure;

e. exerting a force on said translucent particles to remove those translucent particles with selectively weakened attraction for said photoconductive member and to thereby obtain a particle image; and

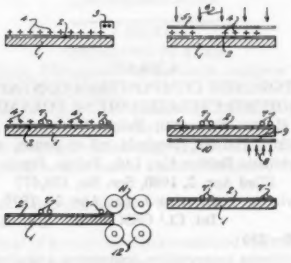
f. bringing said particle image into close contact with a color developing agent which develops said colorless dye into a color different from that transmitted by said translucent particles.

4,294,903

PROCESS FOR ELECTROSTATICALLY DEVELOPING AND PRESSURE-FIXING A REVERSED IMAGE INCLUDING CHARGE DISSIPATION PRIOR TO FIXING

Donald Kings, Saint Nicolas d'Aliermont, and Pham K. Quang, Dieppe, both of France, assignors to Rhone Poulenc Systemes, Creteil, France

Filed Jun. 31, 1980, Ser. No. 174,130
Claims priority, application France, Aug. 8, 1979, 79 20264
Int. Cl.³ G03G *13/22*
U.S. Cl. 430—98 **5 Claims**



1. In an electrophotographic copying process for obtaining a reversed image of an original negative transparency by uniformly electrostatically charging a copying paper, dissipating the electrostatic charges in selected areas corresponding to the transparent areas of the original negative, developing the copying paper by depositing toner on the selected areas and fixing the toner by passing the copying paper between metal pressure rollers,

the improvement comprising,

dissipating the remaining uniform electrostatic charge on the copying paper after the development step but before the fixing step.

2. The process of claim **1** in which the copying paper comprises a support and a photoconductive layer on said support, wherein the dissipation of the remaining uniform electrostatic charge is obtained by illuminating the support.

4,294,904

INDUCTIVE DEVELOPMENT MATERIALS FOR A MAGNETIC DEVELOPMENT PROCESS

Joseph Mammino, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1979, Ser. No. 96,593
Int. Cl.³ G03G *13/09*
U.S. Cl. 430—122 **8 Claims**

1. A magnetic brush inductive development process comprising the steps of providing an electrostatographic imaging member having a recording surface, forming an electrostatic latent image on said recording surface, and contacting the recording surface with an electrostatographic developer mixture comprising electrically conductive carrier particles and a finely-divided toner composition, said toner composition comprising a colorant, a thermoplastic resin, a magnetic or magnetically attractable material, present in an amount of from about 10% to about 80% by weight, and being selected from the group consisting of magnetite, ferrites, iron, and nickel, and a triboelectric charging-enhancing material dispersed in the toner composition, present in an amount of between about 0.25% to about 15% by weight, and selected from the group consisting of alkyl pyridinium compounds, long chain hydrazinium compounds, quaternary ammonium compounds, and fluorosurfactants comprising ionic solubilizing groups linked to highly branched perfluoro groups, said toner composition being characterized as possessing triboelectric charging properties such that it is charged to a level of from about 15 microcoulombs per gram to about 30 microcoulombs per gram of toner composition, a resistivity of at least 10^{14} ohm-cm, and promotes homogeneous mixing of said toner composition with said carrier particles thereby improving transport of the toner particles and avoiding clumping of the toner particles, whereby at least a portion of said finely-divided toner composition is attracted to and deposited on said recording surface in conformance with said electrostatic image.

4,294,905

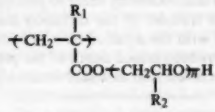
LIGHT-SENSITIVE LITHOGRAPHIC PRINTING PLATE AND COMPOSITIONS THEREFORE WITH MULTIPLE RESINS

Yoshio Okishi; Akinobu Koike, and Shizuo Miyano, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minamiashigara, Japan

Filed Jun. 18, 1979, Ser. No. 49,246
Claims priority, application Japan, Jun. 16, 1978, 53-72787
Int. Cl.³ G03C *1/60, 1/52;* G03F *7/08*
U.S. Cl. 430—175 **27 Claims**

1. A light-sensitive lithographic printing plate comprising a support having provided on at least one surface thereof a light-sensitive layer comprising a light-sensitive component, a first resin and a second resin having poor compatibility with said first resin, said first resin including side chains which are compatible with said second resin and said first resin selectively accumulating at the outermost surface of said light-sensitive layer to impart higher oleophilicity thereto whereby the outermost surface of said light-sensitive layer exhibits higher oleophilicity than the balance of the light-sensitive layer, wherein said light-sensitive layer comprises:

(a) as said first resin, a copolymer having repeating units of the formulae (I) and (II):



(I)

wherein R_1 represents a hydrogen atom or a methyl group, R_2 represents a hydrogen atom, a methyl group, an ethyl group or a chloromethyl group, and n represents an integer of 1 to 10;

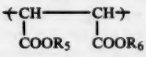
(II)

wherein R_3 represents a hydrogen atom or a methyl group and having an acid value of about 10 to 100;

(b) as said second resin, a copolymer having repeating units of the formulae (III) and (IV):

(III)

wherein R_4 represents a hydrogen atom, a methyl group, an ethyl group, a methoxy group, an ethoxy group or an aryl group;



(IV)

wherein R_5 represents a hydrogen atom, a methyl group or an ethyl group, and R_6 represents an alkyl group or an aryl group; and

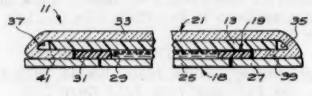
(c) a diazo compound, as said light-sensitive component.

4,294,906

INSTANT PROCESSING SLEEVE

Philip D. Bechle, Rochester, and Joseph A. Roth, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 14, 1980, Ser. No. 140,072
Int. Cl.³ G03C *1/48*
U.S. Cl. 430—207 **6 Claims**



1. A processing sleeve for receiving photographic film processable by a fluid to form an imagewise distribution of material for transfer by diffusion from the film to an image-receiving sheet; said sleeve comprising:

an image-receiving sheet including means for accepting and immobilizing the diffusion material from the film to form a visible image in the receiving sheet;

sheet means, superposed with said receiving sheet, including a generally flat section and doubled over portions, said portions and said flat section forming channels for slidably receiving the film into juxtaposition with said receiving sheet with the film between the portions and the flat section whereby the film is spaced from the receiving sheet; and

means for supplying the processing fluid between the received film and said receiving sheet to process the film and bring about the transfer of the diffusion material to said receiving sheet with the doubled over portions assisting in establishing a predetermined depth of the processing fluid between the received film and said receiving sheet.

4,294,907

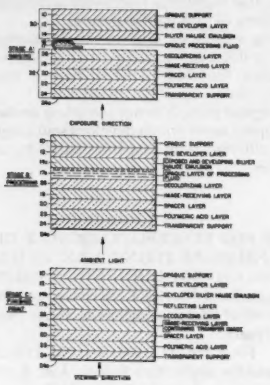
IMAGE-RECEIVING ELEMENTS

Irena Y. Bronstein-Bonte, Newton; Edward P. Lindholm, Boston, and Lloyd D. Taylor, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 24, 1980, Ser. No. 143,281
Int. Cl.³ G03C *5/54, 1/40*
U.S. Cl. 430—213 **11 Claims**

1. An image-receiving element for use in a diffusion transfer process, said image-receiving element comprising, in sequence, a transparent support, an image-receiving layer for a diffusible image-providing material, and a layer adapted to decolorize a pH-sensitive phthalein dye in aqueous alkaline solution, said decolorizing layer comprising a polyoxyalkylene decolorizing agent hydrogen bonded with at least one other polymer.

2. An image-receiving element as defined in claim **1** wherein said diffusible image-providing material is a dye and said image-receiving layer contains a mordant.



3. An image-receiving element as defined in claim **2** wherein said mordant contains quaternary ammonium moieties.

4,294,908

PHOTORESIST COMPOSITION CONTAINING MODIFIED CYCLIZED DIENE POLYMERS

Yoshiyuki Harita, Kawasaki; Yoichi Kamoshida, Yokohama, and Kunihiro Harada, Machida, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,477
Claims priority, application Japan, Apr. 24, 1979, 54-50694
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—286 **15 Claims**

1. A photoresist composition comprising a cyclized product obtained by contacting a conjugated diene polymer or copolymer having sites of unsaturation in the main chain or side chains with a fluorine-containing substituted sulfonic acid compound of the formula:

$$CF_nH_{3-n}SO_3R \text{ or } CF_nH_{3-n}SO_2X$$

wherein R is hydrogen, alkyl or $CF_nH_{3-n}SO_2$, X is halogen, and n is 1, 2 or 3, in an inert solvent, and a photosensitive crosslinking agent soluble in an organic solvent.

4,294,909

PHOTOSENSITIVE NEGATIVE-WORKING TONING PROCESS

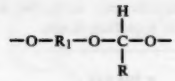
Ross A. Lee, Webster, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 26, 1979, Ser. No. 106,401
Int. Cl.³ G03C *5/04*
U.S. Cl. 430—291 **10 Claims**

1. A process for preparing negative tonable images which comprises exposing imagewise a photosensitive element comprising a support bearing a layer of a negative-working tonable photoimaging composition which comprises

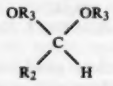
(a) at least one organic polymeric binder taken from the group consisting of polyvinylformal, polyvinylpyrrollidone, polyacrylate, cellulose acetate, polymethacrylate, and polyvinyl acetate;

(b) a photosensitizer which upon absorption of actinic radiation is capable of generating an acid; and at least one acetal compound taken from the group of



(c) (1)

wherein R is hydrogen, alkyl of 1 to 18 carbon atoms, phenyl and substituted phenyl, and R_1 is taken from the group of alkylene of 2 to 12 carbon atoms and heteroalkylene of 2 to 12 carbon atoms, and



(2)

wherein R_2 is alkyl of 1 to 18 carbon atoms, furyl, substituted furyl, phenyl, substituted phenyl, naphthyl, and substituted naphthyl, R_3 is alkyl of 1 to 18 carbon atoms, and OR_3 when taken together form a 5, 6 or 7 membered ring, the polymeric binder (a) being plasticized by the decomposition product of one of compound (c) (1), compound (c) (2) or the combination of compounds (c) (1) and (2), and toning the exposed image areas of said element.

4,294,910

PRINTING PLATES

Hans Wielinga, Hilversum, Netherlands, assignor to Vickers Limited, London, England

Continuation of Ser. No. 781,102, Mar. 25, 1977, abandoned, which is a continuation of Ser. No. 593,697, Jul. 7, 1975, abandoned. This application Aug. 11, 1980, Ser. No. 177,283

Claims priority, application United Kingdom, Jul. 8, 1974, 30264/74

Int. Cl.³ G03F *7/02;* G03C *5/00*

U.S. Cl. 430—302 **11 Claims**

1. A method of processing a pre-sensitized radiation sensitive plate which method comprises

(i) image-wise exposing to radiation a pre-sensitized radiation sensitive plate, said plate being adapted for the manufacture of a lithographic printing plate or a printed circuit or an integrated circuit, and said plate comprising a metallic substrate and a radiation sensitive layer comprising an organic photosensitive compound, so that said radiation sensitive layer includes areas exposed to radiation and areas not exposed to radiation, said areas being of differing solubility and comprising a more-soluble area,

(ii) thereafter developing the image-wise exposed radiation sensitive layer by selectively removing said layer from said more-soluble area and revealing the substrate underlying said more-soluble area,

(iii) thereafter treating the plate with an aqueous solution to provide a water-soluble layer overlying the revealed substrate and the previously-exposed radiation sensitive layer not removed during said developing step, said water-soluble layer being formed by applying to said plate an aqueous solution of at least one water-soluble salt selected from the group consisting of a sodium dodecyl phenoxy benzene disulphonate, a sodium salt of an alkylated naphthalene sulphonic acid, a disodium salt of methylene dinaphthalene sulphonic acid, a sodium salt of a sulphonated alkyldiphenyl oxide, a sodium dodecyl benzene sulphonate, lithium nitrate, and mixtures thereof,

(iv) thereafter burning-in said plate to adapt said plate for lithographic printing, or printed circuit or integrated circuit said burning-in being conducted in the presence of scum-forming contaminants, and

(v) removing said water-soluble layer from said plate with water, thereby removing scum-forming contaminants from the area of the revealed substrate of said plate.

4,294,911

DEVELOPMENT OF LIGHT-SENSITIVE QUINONE DIAZIDE COMPOSITIONS USING SULFITE STABILIZER

John R. Guild, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,765

Int. Cl.³ G03C *5/34;* G03F *7/08;* B05D *3/06*

U.S. Cl. 430—326 **23 Claims**

1. A method of developing an image-wise-exposed layer of a light-sensitive quinone diazide composition comprising contacting said layer with an alkaline developing composition to remove exposed areas of said layer, said developing composition comprising an aqueous solution containing a quaternary alkanol ammonium hydroxide developing agent, in a sufficient concentration to remove exposed areas of said layer, and a stabilizing concentration of a sulfite.

4,294,912

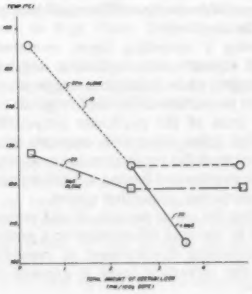
THERMALLY RESPONSIVE COBALT(III) COMPLEX IMAGING COMPOSITIONS HAVING LOWERED ACTIVATION TEMPERATURES

Anthony Adin, Rochester; John W. Boettcher, Ontario, and James C. Fleming, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,703

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—341 **32 Claims**



1. In a dye-forming composition including

a thermally-activatible precursor composition including a cobalt(III) complex containing releasable ligands;

an amplifier that reacts with either cobalt(II) or released ligands to form an agent for conversion of cobalt(III) to cobalt(II) and the release of ligands;

a first destabilizer compound which when heated with said amplifier for a specified time causes conversion of said cobalt(III) complex to cobalt(II) and released ligands; and

a dye-former capable of generating a dye in response to said conversion of the cobalt complex;

the improvement wherein said composition further includes a second destabilizer compound different from said first destabilizer compound which, when heated with said amplifier for said time without said first compound, converts said cobalt(III) complex to cobalt(II) and released ligands, said first and second destabilizer compounds together being present in admixture in respective individual amounts that provide an initiation temperature for the conversion of said complex at said specified heating time that is lower than the initiation temperatures that result when either of said destabilizer compounds is used alone in said respective individual amount.

4,294,913
INFORMATION CARRIERS, METHOD OF FORMING AND COPYING SAID CARRIERS

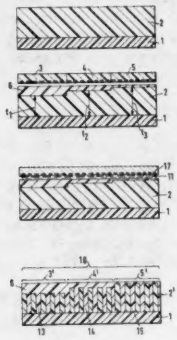
Roland Moraw, and Renate Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 861,491, Dec. 16, 1977. This application Aug. 7, 1979, Ser. No. 64,645

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657246

Int. Cl.[3] G03C 7/00

U.S. Cl. 430—396 15 Claims



1. A process for producing an original of an information carrier for use in zero order diffraction color projection which comprises the steps of:

(a) exposing a recording layer, mounted on a carrier, through separate color separation originals to form relief part-images, each relief part-image corresponding to a different projection color, said originals being transparent in the areas of the particular projection colors of the individual color separation originals each of said relief part-images of the projection color adjoining one another without overlap and having a depth corresponding to one of the particular projection colors;

(b) exposing the entire portion of said recording layer to be utilized in carrying information to a grating pattern without intervening development to provide a structure in which the recording layer is exposed through to said carrier;

(c) said image-wise exposure through each individual color separation original provided with an energy density equal to that required to obtain the individual projection color; and

(d) developing said exposed recording layer.

4,294,914
PHOTOGRAPHIC BLEACH COMPOSITIONS AND METHODS OF PHOTOGRAPHIC PROCESSING

John R. Fyson, London, England, assignor to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/GB79/00152, § 371 Date May 14, 1980, § 102(e) Date May 2, 1980, PCT Pub. No. WO80/00624, PCT Pub. Date Apr. 3, 1980

PCT Filed Sep. 14, 1979, Ser. No. 192,952

Claims priority, application United Kingdom, Sep. 14, 1978, 36816/78

Int. Cl.[3] G03C 5/32, 5/38, 5/44, 5/52

U.S. Cl. 430—418 15 Claims

1. A method of processing a photographic color material comprising the step of bleaching or bleach-fixing said material with a composition comprising, as the bleaching agent, a ferric complex of an alkyliminodiacetic acid, the alkyl group of which contains from 1 to 6 carbon atoms.

10. An aqueous photographic bleaching solution containing a water-soluble halide and, as the bleaching agent, a ferric complex of an alkyliminodiacetic acid, the alkyl group of which contains from 1 to 6 carbon atoms.

4,294,915
SILVER HALIDE DEVELOPING AGENTS

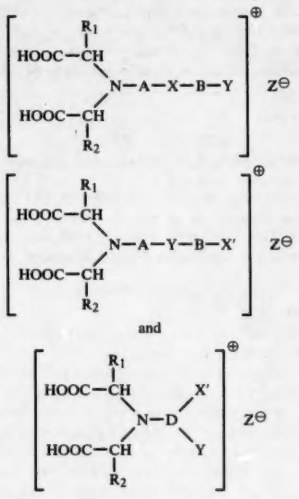
Elbert M. Idelson, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 89,555, Oct. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 1,447, Jan. 8, 1979, abandoned. This application Jul. 11, 1980, Ser. No. 168,642

Int. Cl.[3] G03C 5/30

U.S. Cl. 430—441 6 Claims

1. A photographic method which comprises treating an exposed silver halide emulsion with an aqueous alkaline processing composition containing a silver halide developing agent which is represented by a formula selected from the group consisting of



and

wherein R_1 and R_2 are each H or when taken together represent the carbon atoms necessary to complete a five or six member heterocyclic moiety; X and X' are each radicals containing an onium group; Y is a hydroquinonyl group; A and B are each alkylene having from 1 to 6 carbon atoms with the proviso that the sum of the carbon atoms of A and B is not greater than 8; D is a saturated aliphatic radical having up to 6 carbon atoms; and Z is an anion.

4,294,916
PHOTOGRAPHIC SILVER HALIDE MATERIAL CONTAINING A DYE FILTER OR A DYE ANTI-HALATION LAYER

Stephen R. Postle, Brentwood, and Alexander Psaila, Chelmsford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

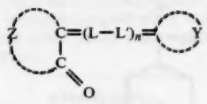
Filed Apr. 30, 1980, Ser. No. 145,174

Claims priority, application United Kingdom, May 22, 1979, 17692/79

Int. Cl.[3] G03C 1/84

U.S. Cl. 430—522 8 Claims

1. Photographic silver halide material which comprises in at least one layer a solid dispersion of at least one water-insoluble dye of the general formula



(I)

wherein L and L' each represent an optionally substituted methine group, n is 0, 1 or 2, Z represents the atoms necessary to complete an optionally substituted pyrazolone, hydroxypyridone, barbiturate, thiobarbiturate, dimedone or indan-1, 3-dione, Y represents the atoms necessary to complete an optionally substituted benzimidazole, benzoxazole, benzthiazole, benzselenazole, indole, lepidinole or quinole, at least one of the rings Z and Y being substituted by a —COOH group or being substituted by a group which comprises a —COOH group, in a binder.

4,294,917

PHOTOGRAPHIC SILVER HALIDE MATERIAL CONTAINING A DYE FILTER OR A DYE ANTI-HALATION LAYER

Stephen R. Postle, Brentwood, and Alexander Psaila, Chelmsford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

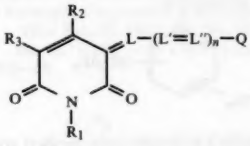
Filed Apr. 30, 1980, Ser. No. 145,175

Claims priority, application United Kingdom, May 22, 1979, 17693/79

Int. Cl.³ G03C *1/84*

U.S. Cl. 430—522 **6 Claims**

1. Photographic silver halide material which comprises in at least one layer a solid dispersion of a water-insoluble dye of the formula



(I)

wherein each of L, L' and L'' are an optionally substituted methine group, n is 0 or 1, Q is phenyl or phenyl substituted by halogen, hydroxy or di-lower-alkylamino, or benzimidazole, benzoxazole, benzthiazole, benzselenazole, lepidinole, quinole or indole which are unsubstituted or substituted by halogen, cyano, nitro or lower alkyl, R_1 represents a hydrogen atom or an optionally substituted alkyl, benzyl, β-phenylethyl, cycloalkyl, phenyl, tolyl, chlorophenyl, methoxyphenyl, ethoxyphenyl or heterocyclic radical or an optionally substituted amino group, R_2 represents a hydrogen atom or a hydroxy, amino, —CN, —$COOR^1$, —$CONR^1R^2$ or —COR^1 group or an optionally substituted alkyl, benzyl, β-phenylethyl, cycloalkyl, phenyl, tolyl, chlorophenyl, methoxyphenyl, ethoxyphenyl or heterocyclic radical, and R_3 represents hydrogen, a —CN, —$COOR^3$, —$CONR^3R^4$, —SO_3H, —$SO_3^{\ominus}$ or —COR^3 group, where R^1, R^2, R^3 and R^4 each independently represent a hydrogen atom or an optionally substituted alkyl, benzyl, β-phenylethyl, cycloalkyl, phenyl, tolyl, chlorophenyl, methoxyphenyl, ethoxyphenyl or heterocyclic radical, in a binder.

4,294,918

COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Morio Yagihara, and Yukio Yokota, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 14, 1980, Ser. No. 168,917

Claims priority, application Japan, Jul. 12, 1979, 54-88440

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—553 **16 Claims**

1. A color photographic silver halide light-sensitive material containing a colorless photographic cyan color-forming coupler having, in a position for coupling with the oxidation product of an aromatic primary amine developing agent, as a coupling-off group, at least one alkoxy group substituted with a sulfinyl group represented by the formula (I)

—O—R—SO—R_1 (I)

wherein R represents a saturated or unsaturated divalent aliphatic group containing from 1 to 10 carbon atoms which may be straight or branched chain and may be substituted; and R_1 represents a substituted or unsubstituted straight or branched chain alkyl group, an alkenyl group, an aralkyl group, an aralkenyl group, a cycloalkyl group, an aryl group or a heterocyclic group; and said heterocyclic group being connected with a sulfinyl group on the position of a carbon atom of the heterocyclic group.

4,294,919

DIRECT POSITIVE SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Nobuyuki Tsujino, and Shigeo Hirano, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

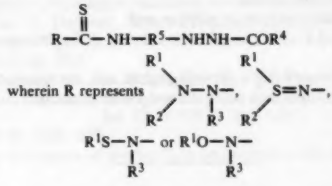
Filed Jun. 6, 1980, Ser. No. 156,949

Claims priority, application Japan, Jun. 6, 1979, 54-70854

Int. Cl.³ G03C *1/36*

U.S. Cl. 430—559 **20 Claims**

1. A direct positive silver halide photographic light-sensitive material comprising a support having coated thereon an internal latent image emulsion layer which contains a light-sensitive silver halide of the type that is not previously fogged and a hydrophilic colloid layer, at least one of said layers containing a compound represented by the formula (I) in an amount which gives a suitable maximum density when the light-sensitive material is developed by a surface developing solution



(I)

wherein R represents

wherein R^1 represents R^6 or R^6CO—; and R^6 represents an aliphatic group, an aromatic group, a heterocyclic aromatic group or hydrogen; R^2 and R^4, which may be the same or different, each represents an aliphatic group, an aromatic group, a heterocyclic aromatic group or hydrogen; or R^1 and R^2 together can form a ring; R^3 represents hydrogen or an aliphatic group; R^5 represents Y or X—A—Y wherein X and Y, which may be the same or different, each represents a divalent aromatic group, and A represents a divalent connecting group selected from —CONH—, NHCONH—, —SO_2NH—, —B—CONH— and —B—SO_2NH— wherein B represents —E—, —O—E— or —S—E— wherein the O and S is bonded to X; and E represents a divalent aliphatic group.

4,294,920

PHOTOGRAPHIC SILVER HALIDE EMULSION

Günter Helling, Siegburg; Wilhelm Saleck, Bergisch-Gladbach, and Peter Bergthaller, Cologne,all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 32,555, Apr. 23, 1979, abandoned. This application Dec. 4, 1980, Ser. No. 212,890

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818678

Int. Cl.[3] G03C *1/02, 1/72*

U.S. Cl. 430—569 6 Claims

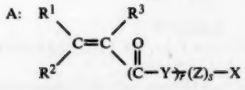
1. A light sensitive photographic silver halide emulsion containing silver halide particles dispersed in a hydrophilic colloid binder composition wherein the improvement comprises

the binder composition contains 500 mg to 500 g per mol of the silver halide and up to 100% of the binder composition of a polymer

wherein the polymer used contains recurring units of compound A

with recurring units of compound B, said compound B being in an amount of 0.01 to 20% by weight of said polymer, and said polymer having an S-atom in the main chain, which compounds A and B correspond to the following formulae:

Formulae A and B



B: $H-S_n-(Q^1-W)_m\,Q^2-S-H$

in which

R^1, R^2 and R^3 which may be the same or different, represent hydrogen or substituted or unsubstituted alkyl or aryl;

Y represents oxygen or $—NR^4—$;

R^4 represents hydrogen or alkyl, in particular with 1 to 4 carbon atoms;

Z represents a substituted or unsubstituted alkylene or a substituted or unsubstituted arylene;

X represents NR^1R^2, H, OH, SO_3H, PO_3H, COOH or a heterocyclic group;

Q^1 and Q^2 which may be the same or different represent a substituted or unsubstituted alkylene or arylene group or a heterocyclic group;

W represents oxygen or sulphur and

n, m, r and s which may be the same or different, represent 0 or 1;

the said polymer being a peptizing agent, and, the remainder of the binder composition being made up with protective colloid.

4,294,921

METHOD OF HARDENING GELATIN

Jun Yamaguchi; Takashi Naoi; Hidefumi Sera; Kunio Ishigaki, and Masasi Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

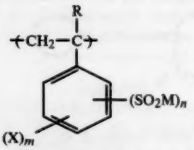
Filed Jun. 23, 1980, Ser. No. 162,235

Claims priority, application Japan, Jun. 22, 1979, 54-78686

Int. Cl.[3] G03C *1/30;* C08L *89/00;* B01J *13/02*

U.S. Cl. 430—621 9 Claims

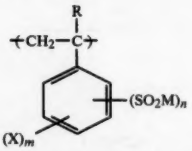
1. A method of hardening gelatin in which said gelatin is hardened by both a gelatin hardener and a polymer having at least 0.01 mol % of a repeating unit of the formula (I):



(I)

wherein R represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, and a halogen atom; M represents a hydrogen atom, an alkali metal atom, an alkali earth metal atom, or an organic base; X represents an alkyl group having 1 to 6 carbon atoms, an alkoxy group, an alkylamino group, or a halogen atom; m represents 0, 1 or 2; and n represents 1 or 2.

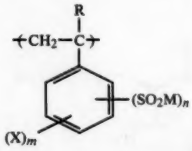
8. In a photographic material containing a gelatin emulsion layer, the improvement wherein said gelatin is hardened with a gelatin hardener and a polymer having at least 0.01 mol % of a repeating unit of the formula (I):



(I)

wherein R represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, and a halogen atom; M represents a hydrogen atom, an alkali metal atom, an alkali earth metal atom, or an organic base; X represents an alkyl group having 1 to 6 carbon atoms, an alkoxy group, an alkylamino group, or a halogen atom; m represents 0, 1 or 2; and n represents 1 or 2.

9. In a method for forming microcapsules by co-acervating gelatin and hardening the gelatin wall, the improvement which comprises hardening said gelatin wall using both a gelatin hardener and a polymer having at least 0.01 mol % of a repeating unit of formula (I):



(I)

wherein R represents a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, and a halogen atom; M represents a hydrogen atom, an alkali metal atom, an alkali earth metal atom, or an organic base; X represents an alkyl group having 1 to 6 carbon atoms, an alkoxy group, an alkylamino group, or a halogen atom; m represents 0, 1 or 2; and n represents 1 or 2.

4,294,922

METHOD FOR MONITORING PREGNANCY IN MILK-PRODUCING DOMESTIC ANIMALS

Robert B. Heap, Cambridge, England, assignor to National Research Development Corporation, London, England

Filed Dec. 20, 1979, Ser. No. 105,604

Claims priority, application United Kingdom, Dec. 29, 1978, 50234/78

Int. Cl.[3] G01N *33/54;* C12Q *1/44*

U.S. Cl. 435—7 17 Claims

1. A method for diagnosing pregnancy in a milk-producing domestic animal, comprising determining the concentration of oestrogen conjugates contained in a sample cmprising whole milk or a fraction thereof of the animal and comparing said

concentration with the average concentration of oestrogen conjugates in the milk of a non-pregnant similar animal of the same species, whereby a significantly higher concentration in said sample than said average concentration indicates that said animal is pregnant.

4,294,923

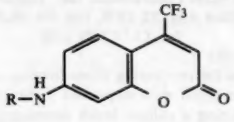
SUBSTRATES AND METHOD FOR DETERMINING ENZYMES

Robert E. Smith, 574 Escondido Cir., Livermore, Calif. 94550, and Eugene R. Bissell, 101 Via Lucia, Alamo, Calif. 94507

Filed Apr. 23, 1979, Ser. No. 32,444
Int. Cl.³ C12Q *1/38, 1/36*
U.S. Cl. 435—23 **14 Claims**

1. A method for determining the presence of an enzyme in an enzyme-containing analyte, comprising:

(a) contacting the analyte with a substrate which can be hydrolyzed by said enzyme to liberate 7-amino-4-trifluoromethylcoumarin, said substrate having the formula



wherein R is an amino acid, a peptide, an amino acid which has been reacted with a blocking group, or a peptide, the terminal amino acid of which has been reacted with a blocking group, thereby forming an analyte-substrate mixture;

(b) incubating the analyte-substrate mixture under enzyme-hydrolyzing conditions to form an enzyme hydrolyzate; and

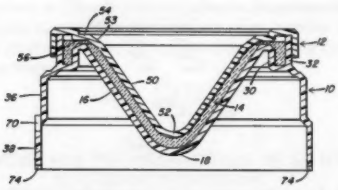
(c) fluorometrically or spectrophotometrically determining the presence of 7-amino-4-trifluoromethylcoumarin in the enzyme hydrolyzate.

4,294,924

METHOD AND CONTAINER FOR GROWTH OF ANAEROBIC MICROORGANISMS

Pasquale L. Pepicelli, Chelmsford; George F. Lyman, N. Andover, and Robert A. Mavilia, Braintree, all of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed Feb. 25, 1980, Ser. No. 123,966
Int. Cl.³ C12Q *1/24;* C12M *1/22, 1/16*
U.S. Cl. 435—30 **16 Claims**



1. A container for culturing anaerobic microorganisms comprising:

a base having a cone-shaped dish and a surrounding trough with a shoulder joining them together,

a downwardly extending sleeve forming part of the base and surrounding the dish and having its lower edge extending below the bottom of the dish so that the base can be supported on a flat surface by the lower edge of the sleeve,

and a cover having a cone-shaped closure wall and a surrounding flange and down turned rim portion, said flange being sized to overlie and be closely spaced from the shoulder of the base and the rim portion sized to overlie the trough when the cover is placed on the base, the space between the shoulder and flange defining a narrow gap which may be sealed by agar spread between them,

said cone-shaped closure wall lying adjacent the cone-shaped dish of the base when the cover is in place on the base and defining a closed chamber of a preselected volume between them.

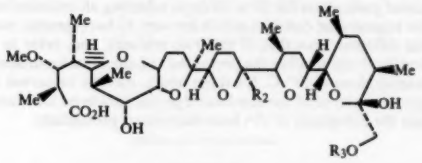
4,294,925

MONENSIN URETHANE DERIVATIVES PRODUCED BY STREPTOMYCES

Chao-Min Liu, and John Westley, both of Cedar Grove, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 77,415, Sep. 20, 1979, Pat. No. 4,263,427, which is a continuation-in-part of Ser. No. 964,564, Nov. 29, 1978, abandoned. This application Nov. 10, 1980, Ser. No. 205,478
Int. Cl.³ C12P *19/26, 17/16*
U.S. Cl. 435—84 **1 Claim**

1. A process to produce a compound of the formula



wherein R_2 is methyl or ethyl and R_3 is —$CONHR_4$ wherein R_4 is phenethyl which comprises cultivating a strain of Streptomyces selected from the group consisting of Streptomyces sp. X-14667, NRRL 11336, Streptomyces sp. X-14573, NRRL 11337 and Streptomyces sp. X-14575, NRRL 11338 in an aqueous carbohydrate solution containing a nitrogenous nutrient under submerged aerobic conditions and thereafter isolating the end product from said solution.

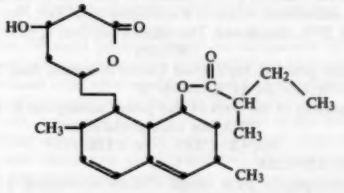
4,294,926

HYPOCHOLESTEREMIC FERMENTATION PRODUCTS AND PROCESS OF PREPARATION

Richard L. Monaghan, Somerset; Alfred W. Alberts, Short Hills; Carl H. Hoffman, Scotch Plains, and George Albers-Schonberg, Princeton, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 48,946, Jun. 15, 1979, Pat. No. 4,231,938. This application Jan. 23, 1980, Ser. No. 114,458
Int. Cl.³ C12P *7/26, 17/06*
U.S. Cl. 435—125 **3 Claims**

1. A process of producing a compound of the formula:



or its corresponding free acid which comprises fermenting a microorganism of the genus *Aspergillus terreus* and isolating the product thereof.

4,294,927

GENETIC PROCESS FOR THE PREPARATION OF ANTIBIOTIC-PRODUCER MICROMONOSPORA STRAINS

Lajos Alföldi; Katalin Balint nee Fodor; Csaba Kari; Istvan Török, all of Szeged; György Szvoboda, Budapest; Tibor Lang, Budapest; Istvan Gado, Budapest, and Gabor Ambrus, Budapest, all of Hungary, assignors to Gyogyszerkutato Intezet, Budapest, Hungary

Filed Nov. 8, 1979, Ser. No. 92,554

Claims priority, application Hungary, Nov. 13, 1978, G0 1430

Int. Cl.[3] C12N *15/00*

U.S. Cl. 435—172 9 Claims

1. A process for preparing an antibiotic-producing Micromonospora strain having modified genetic material, which comprises preparing, following cultivation in a glycine medium, a protoplast suspension of each of two genetically different mutants of antibiotic-producing Micromonospora with lysozyme, under osmotically buffered conditions ensured by sucrose, combining the two suspensions thus obtained in the presence of polyethylene glycol, incubating at room temperature, suspending the resulting fused protoplasts in soft agar, then plating the suspended protoplasts on an agar plate containing sucrose, proline and inorganic salts, incubating the plated protoplasts for 20 to 30 days, selecting all colonies from the regenerated colonies which are sure to have genetic material different from that of said two mutants, and, prior to fusion, heat-inactivating the protoplasts of one of said mutants by heating them at 55° C. for three hours, thereby to permit the genetic material of the non-heated protoplasts to be transferred into the cytoplasm of the heat-inactivated protoplasts.

4,294,928

DENITRIFICATION OF A GAS STREAM

Andree E. Tamony, Antioch, and Charles R. Youngson, Jr., Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1980, Ser. No. 176,439

Int. Cl.[3] B01D *53/34*

U.S. Cl. 423—235 1 Claim

1. A process for removing NO_x from a gas stream wherein at least part of the NO_x is present as nitric oxide which comprises (a) mixing more than one molecular proportion of chlorine per molecular proportion of said nitric oxide with the gas stream, (b) subsequently contacting the resulting mixture of gases with aqueous hydrochloric acid at a temperature of from about 10° C. to about 50° C. for a time sufficient to oxidize a substantial proportion of the nitric oxide present, and (c) scrubbing the gas stream exiting from step (b) with a mixture of aqueous sodium hydroxide and sodium hypochlorite at a temperature of from about 30° C. to about 50° C.

4,294,929

PRODUCTION OF EDIBLE PROTEIN SUBSTANCES

Gerald L. Solomons, High Wycombe, and Gerald W. Scammell, Chinnor, both of England, assignors to Ranks Hovis McDougall Limited, London, England

Continuation of Ser. No. 711,964, Aug. 5, 1976, Pat. No. 4,061,781, which is a continuation of Ser. No. 414,102, Nov. 8, 1973, abandoned, which is a continuation of Ser. No. 140,303, May 4, 1971, abandoned. This application Dec. 5, 1977, Ser. No. 857,591

Claims priority, application United Kingdom, May 14, 1970, 23452/70; Jun. 24, 1970, 30584/70

The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.

Int. Cl.[3] C12N *1/14;* C12R *1/77*

U.S. Cl. 435—254 9 Claims

1. Biologically pure fungal culture containing a strain of *Fusarium graminearum* Schwabe I.M.I. 145425 or a mutant or variant thereof in a culture medium in which this strain is present in a culture medium containing or being supplied with nutrients or additives necessary for the sustenance and multiplication of the strain, the medium having a pH between 3.5 and 7 and the temperature of the medium being maintained at a precise value within the range of between 25° and 34° C.

4. A biologically pure culture of the microorganism *Fusarium graminearum* Schwabe, having the identifying characteristics of IMI 145425, said culture being capable of producing proliferation of said microorganism in a recoverable quantity upon fermentation in a culture medium containing essentially growth-promoting nutrient substances, wherein said proliferated organism comprises an edible protein-containing substance possessing a high net protein utilization value of at least 65 based on the α-amino nitrogen.

4,294,930

PROCESS FOR IMPROVING THE RECOVERY OF MICROBIAL CELL BIOMASS

Jeffrey T. Barach, and Leslie Bluhm, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 22, 1979, Ser. No. 68,876

Int. Cl.[3] C12N *1/02*

U.S. Cl. 435—261 4 Claims

1. A process for recovering chain-forming microorganisms from a culture broth with improved yield, consisting essentially of subjecting a culture broth containing chain-forming microorganisms to shearing conditions in apparatus selected from the class consisting of high speed dispersers, homogenizers and sonic oscillators sufficient to shorten the chain length of said microorganisms and thereby substantially reduce the packed cell volume thereof, and then recovering said microorganisms from said culture broth by centrifugation.

4,294,931

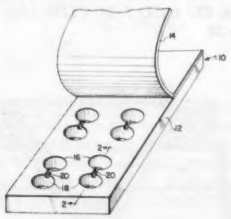
DEVICE FOR CONDUCTING MICROBIOLOGICAL RADIORESPIROMETRIC ASSAYS

Gilbert V. Levin, Annapolis, and Patricia A. Straat, Baltimore, both of Md., assignors to Biospherics Incorporated, Rockville, Md.

Filed Dec. 26, 1979, Ser. No. 107,383

Int. Cl.[3] C12M *1/20*

U.S. Cl. 435—301 8 Claims



1. A device for conducting a microbological radiorespirometric assay under aerobic or anaerobic conditions which device comprises a support member which includes a plurality of pairs of chambers, one chamber in each said pair containing a radioactive labeled substrate which is capable of being metabolized by at least some microorganisms to yield a radioactive gas, the other chamber in each said pair containing a means for collecting radioactive gas, the two chambers in each pair being in communication with each other by means of a passageway, said passageway opening into each of said chambers at the upper portion thereof, and closure means for closing said chambers and said passageway, said passageway being situated in said support member or in said closure means.

4,294,932
METHANATION PROCESS

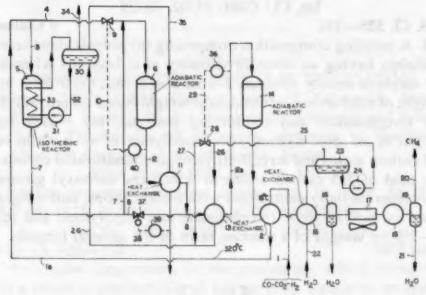
Reiner Lohmüller, Munich; Helmut Schneider, Grünwald, and Allan Watson, Ottobrunn, all of Fed. Rep. of Germany, assignors to Linde AG, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 875,903, Feb. 7, 1978, abandoned. This application Aug. 8, 1979, Ser. No. 64,831

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705151

Int. Cl.³ C10K *3/04*

U.S. Cl. 518—706 1 Claim



1. A process for carrying out a strongly exothermic catalytically promoted chemical reaction to form methane, comprising the steps of:

forming reactant-gas mixture of at least two components capable of undergoing catalytically promoted exothermic reaction, said components consisting essentially of hydrogen and carbon oxide;

subdividing said reactant-gas mixture into two streams;

passing a first of said streams of said reactant-gas mixture into contact with a catalyst in an adiabatic exothermic methanization reaction stage without heating the latter or abstracting heat from the latter to produce a first product mixture;

passing the second of said streams of said reactant-gas mixture through an isothermal exothermic methanization reaction stage into contact with a catalyst capable of promoting said reaction to produce a second product mixture while abstracting heat from said isothermal reaction stage to maintain a substantially constant temperature therein; and

controlling the distribution of said reactant-gas mixture between said streams in response to the temperature of said first product mixture to prevent excessive temperatures from developing in said adiabatic reaction stage, portion of said second product mixture being passed through said adiabatic reaction stage.

4,294,933
PROCESS FOR THE PRODUCTION OF AN ION EXCHANGE MEMBRANE

Kunio Kihara; Hideo Toda, both of Ami; Eiki Yasukawa, Tsuchiura; Toshiaki Ishibashi, Ami, and Taketoshi Tokita, Tsuchiura, all of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

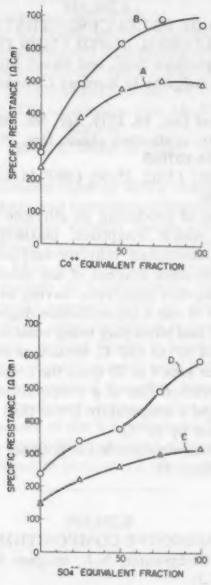
Filed Jul. 5, 1979, Ser. No. 54,883

Claims priority, application Japan, Jul. 13, 1978, 53-84590

Int. Cl.³ C25B *13/00*

U.S. Cl. 521—27 26 Claims

1. A process for the production of a heterogeneous ion exchange membrane in which an ion exchange resin fine powder is dispersed in a thermoplastic resin, which process comprises kneading a silane-modified polyolefin resin selected from the group consisting of silane-grafted polyolefin resins and vinylsilane-copolymerized polyolefin resins, and an ion exchange resin fine powder, extruding the mixture to form a membrane and then subjecting the resulting membrane to a treatment with hot water.



4,294,934
PROCESS FOR THE PRODUCTION OF ELASTIC, OPTIONALLY CELLULAR, POLYURETHANE UREAS

Gerhard Grögler; Jürgen Schwindt; Otto Ganster; Hans-Joachim Meiners, all of Leverkusen, and Hans-Dieter Ruprecht, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 30, 1980, Ser. No. 164,752

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1979, 2928182

Int. Cl.³ C08G *18/76, 18/22, 18/18*

U.S. Cl. 521—160 4 Claims

1. In a process for the production of polyurethane urea elastomers having a gross density of more than 200 kg/m³ comprising: casting a reaction mixture of

(A) an isocyanate prepolymer produced from

(a) 1 mole of a compound containing at least 2 Zerewitinoff-active hydrogen atoms and having a molecular weight of from 400 to 10,000 and

(b) 2 to 10 moles of diisocyanatodiphenylmethane,

(B) an aromatic diamine, and

(C) 0 to 50 mole percent, based on component (B), of a polyol having a molecular weight of from 62 to 6000, the equvalent ratio between component (A) and components (B)+(C) amounting to between 0.9:1 and 1.3:1,

into a mold, hardening the reaction mixture in the mold and subsequently removing it from the mold, the improvement wherein said isocyanate prepolymer (A) has been produced using an isomer mixture comprising:

from 15 to 80 mole percent of 2,4'-diisocyanatodiphenylmethane,

from 20 to 85 mole percent of 4,4'-diisocyanatodiphenylmethane, and

from 0 to 20 mole percent of 2,2'-diisocyanatodiphenylmethane.

4,294,935

METHOD OF PRODUCING ETHYLENE-VINYL ALCOHOL COPOLYMER FILM

Yuji Kodera; Kyoichiro Ikari, and Shunji Miyake, all of Kurashiki, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Filed Dec. 19, 1979, Ser. No. 105,412

Claims priority, application Japan, Dec. 29, 1978, 53-161912; Aug. 22, 1979, 54-107569

Int. Cl.³ B29C *17/02, 25/00;* **C08F** *16/06;* **C08L** *29/04*

U.S. Cl. 525—60 **14 Claims**

11. A method of producing an ethylene-vinyl alcohol copolymer film, which comprises: biaxially or multiaxially stretching a nonstretched ethylene-vinylalcohol copolymer film having a moisture content of not more than 3.5%, said ethylene-vinyl alcohol copolymer having an ethylene content of 20 to 55 mole % and a saponification degree of not less than 96 mole %, and said stretching being conducted within a temperature range of 50° to 150° C. to such an extent that the film is expanded to an area 4 to 20 times the original area; and heat treating said stretched film at a temperature in the range between 100° C. and a temperature lower than the melting point of said copolymer by 10° C.

14. The ethylene-vinylalcohol copolymer film produced by the process of claim **11**.

4,294,936

ADHESIVE COMPOSITIONS

Ralf Korpman, Bridgewater, N.J., assignor to Permacel, New Brunswick, N.J.

Continuation-in-part of Ser. No. 54,541, Jul. 5, 1979, abandoned. This application May 5, 1980, Ser. No. 142,691

Int. Cl.³ C08L *9/06*

U.S. Cl. 525—93 **10 Claims**

1. A pressure-sensitive adhesive composition comprising a synthetic thermoplastic rubbery block copolymer, a non-rubbery polymer and a tackifier resin, wherein said rubbery block polymer is a copolymer of an alkenylarene A block and an aliphatic diene B block in which the alkenylarene is a polymer of styrene, a ring lower alkyl substituted styrene, a ring phenyl lower-alkyl substituted styrene, a ring (lower alkyl substituted) phenyl lower alkyl substituted styrene or a ring cyclohexyl substituted styrene and the aliphatic diene is a conjugated lower aliphatic diene of from 4 to 6 carbon atoms inclusive and said non-rubbery polymer is a copolyester, said copolyester being a polymer of at least two different ester units, each ester unit being a condensation product of a dicarboxylic acid and an alkylene diol of from 2 to 6 carbon atoms; and wherein for every 100 parts of rubbery block copolymer there is employed from about 5 to about 50 parts of the non-rubbery polymer and from about 20 to about 150 parts of tackifier resin.

4,294,937

IMPACT POLYMERS

Richard O. Whitehead, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 18, 1979, Ser. No. 49,840

Int. Cl.³ C08L *9/06, 53/02*

U.S. Cl. 525—99 **6 Claims**

1. A graft copolymer composition having improved toughness consisting essentially of:

(a) from about 4 to about 12 parts by weight of a mixture of a polybutadiene elastomer and a styrene-butadiene two-block copolymer in a weight ratio of styrene-butadiene two-block copolymer to polybutadiene elastomer of about 2:80 to about 4:80, where the average molecular weight of the styrene block of the block copolymer is between about 100,000 and about 150,000, and the average molecular weight of the butadiene block of the block copolymer is between about 30,000 and about 60,000; and

(b) from about 96 to about 88 parts by weight of a polymerized styrene.

4,294,938

THERMAL STABILIZATION OF POLYALKYLENE TEREPHTHALATE RESIN COMPOSITIONS

Charles E. Berr, Wilmington, Del., and Edward J. Deyrup, Northeast, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 15, 1980, Ser. No. 122,063

Int. Cl.³ C08L *67/02, 23/26*

U.S. Cl. 525—101 **9 Claims**

1. A molding composition comprising (a) polyalkylene terephthalate having an inherent viscosity of at least 0.4 wherein the alkylene moiety contains 2–4 carbon atoms, (b) 0–50% by weight of reinforcing material, said weight based on polyalkylene terephthalate and reinforcing material, (c) 1–25% by weight of an ionic hydrocarbon copolymer of an α-olefin of 2–5 carbon atoms and an α,β-ethylenically unsaturated carboxylic acid of 3–5 carbon atoms in which the carboxyl groups have been partially neutralized with metal cations, said weight based on polyalkylene terephthalate and copolymer, and (d) 0.1–5% by weight of a silicone resin of the general formula

wherein R is lower alkyl or phenyl, R′ and R″ are each independently a hydrocarbyl group of 1–20 atoms and one of R′ and R″ can be hydrogen, and n is an integer of between about 5 and 500, said weight based on polyalkylene terephthalate and silicone resin.

4,294,939

COATING COMPOSITION

Eiji Taniguchi; Susumu Akagi, both of Ichihara, and Seiichi Torimitsu, Chiba, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 930,407, Aug. 2, 1978, abandoned. This application Sep. 11, 1980, Ser. No. 186,158

Int. Cl.³ C08L *63/00*

U.S. Cl. 525—118 **4 Claims**

1. An organic solvent-based coating composition comprising:

(I) a water-insoluble polymeric cross-linkable basic nitrogen atom-containing acrylic component comprising at least one film-forming acrylic copolymer containing basic nitrogen atoms, in which component there are present, based on the weight of said component:

(a) 2 to 10% by weight of polymerized units derived from at least one basic nitrogen atom-containing acrylate selected from the group consisting of di(C_{1-2}alkyl-)amino C_{1-3}alkyl acrylates and methacrylates,

(b) 0.5 to 5% (B%) by weight of polymerized units derived from at least one acrylic amide selected from the group consisting of acrylamide and methacrylamide,

(c) 0.5 to 20% (C%) by weight of polymerized units derived from at least one hydroxyl-containing acrylic monomer selected from the group consisting of hydroxy C_{2-4}alkyl acrylates and methacrylates,

(d) 35 to 95% by weight of polymerized units derived from at least one alkyl acrylate selected from the group consisting of C_{1-4}alkyl acrylates and methacrylates, and

(e) 0 to 50% by weight of polymerized units derived from one or more other copolymerizable ethylenically unsaturated monomers, said percentages A, B and C satisfying the relation:

$$\frac{14 - A}{4} \leq B + C \leq 28 - 2A, \text{ and;}$$

(II) a cross-linking component comprising at least one polyepoxide compound having an epoxy equivalent of not more than 400 and containing at least two epoxy groups per molecule, said cross-linkable component (I) and cross-linking component (II) being present in said composition so that the ratio by gram atom of the basic nitrogen atom in said component (I) to the epoxy oxygen atom in said component (II) falls within the range of between 0.3 and 3.0.

4,294,940

RESIN COMPOSITION FOR ELECTROCOATING

Minoru Hino; Takao Oshima, both of Takatsuki; Kazuo Hayatsu, Ibaraki; Michio Yamamoto, Takatsuki, and Seimei Yasui, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 9, 1980, Ser. No. 110,688

Claims priority, application Japan, Jan. 12, 1979, 54-2525; Jul. 19, 1979, 54-92202; Aug. 23, 1979, 54-108016

Int. Cl.³ C08G *18/80, 18/62;* **C25D** *13/06*

U.S. Cl. 525—124 **10 Claims**

1. A resin composition for electrocoating, which comprises (I) a reaction product (G) of 100 parts by weight of an epoxy compound (E) and 5 to 200 parts by weight of a partially esterified and/or partially amidated product (D) which is obtained by partially esterifying and/or partially amidating an adduct (A) of a conjugated diene polymer having a number average molecular weight of 150 to 50,000 with an α,β-unsaturated dicarboxylic acid or its anhydride, wherein said α,β-unsaturated dicarboxylic acid or its anhydride is used in an amount such that the content of the dicarboxylic acid in the adduct (A) becomes 5 to 25% by weight based on the total weight of the adduct (A), with an alcoholic hydroxy group-containing compound (B) and/or a primary or secondary monoamine (C), respectively, said compound (B) and monoamine (C) being used in an amount such that the sum of the molar number of the compound (B) and that of the monoamine (C) becomes 0.7 to 1.2 mol per 1 mol of the α,β-unsaturated dicarboxylic acid or its anhydride, and

(II) a completely blocked organic polyisocyanate in an amount of 5 to 200 parts by weight to 100 parts by weight of the reaction product (G), said mixture of the reaction product (G) and the completely blocked organic polyisocyanate being neutralized.

4,294,941

COMPATIBLE LOW SHRINK RESIN SYSTEMS

Gwilym E. Owen, Jr., Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 14, 1979, Ser. No. 103,751

Int. Cl.³ C08L *67/06*

U.S. Cl. 525—170 **8 Claims**

1. A compatible, moldable composition comprising a thermoplastic resin, a thermosetting resin and a monomer,

a. said thermoplastic resin comprising the terpolymer of vinyl-acetate, methylmethacrylate and acrylic acid;

b. said thermosetting resin comprising an unsaturated polyester produced by the interreaction of propylene glycol, dipropylene glycol, maleic anhydride and adipic acid, the sum of the weight of said dipropylene glycol and said adipic acid comprising not less than about 31.6 percent by weight of the weight of the theoretical yield of the polyester product; and ,

c. said thermoplastic resin comprising from about 7 to about 18 weight percent of said composition, said thermosetting resin comprising from about 31 to about 55 weight percent of said composition and said monomer comprising from about 27 to about 61 weight percent of said composition.

4,294,942

RUBBERY COPOLYMERS OF 2,3-DIMETHYL 1,3-BUTADIENE

James N. Henderson, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 3,835, Jan. 16, 1979, abandoned, which is a continuation of Ser. No. 915,682, Jun. 14, 1978, abandoned, which is a continuation of Ser. No. 825,318, Aug. 17, 1977, abandoned, which is a continuation of Ser. No. 775,125, Mar. 7, 1977, abandoned. This application Feb. 14, 1980, Ser. No. 121,626

Int. Cl.³ C08F *297/02*

U.S. Cl. 525—314 **5 Claims**

1. Stress crystallizable tapered block copolymers of 2,3-dimethyl-1,3-butadiene and butadiene or isoprene in which the 2,3-dimethyl-1,3-butadiene content ranges from about 20 to about 80 mole percent, characterized in that the said tapered block copolymers have one terminal segment of the block made up almost entirely of 2,3-dimethyl-1,3-butadiene units and the other terminal segment made up almost entirely of units of the other diene, either butadiene or isoprene, between these relatively pure terminal blocks is a central segment of gradually changing composition made up of both 2,3-dimethyl-1,3-butadiene units and units of the other diene, 1,3-butadiene or isoprene, said copolymers being further characterized in that the microstructure of the 2,3-dimethyl-1,3-butadiene segments range from about 55 to about 65 percent trans-1,4 and does not exceed about 20 percent 1,2-microstructure.

4,294,943

PROCESS FOR PREPARING FLUORINE-CONTAINING POLYMERS HAVING CARBOXYL GROUPS

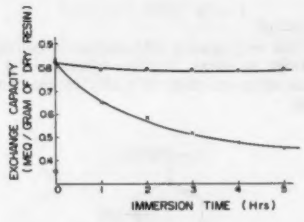
Yasuharu Onoue, Tokyo; Toshikatsu Sata, Tokuyama; Akihiko Nakahara, Tokuyama, and Junichi Itoh, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Division of Ser. No. 898,950, Apr. 21, 1978, Pat. No. 4,200,711. This application Nov. 28, 1979, Ser. No. 92,339

Claims priority, application Japan, Apr. 25, 1977, 52-46861; Dec. 19, 1977, 52-152694

Int. Cl.³ C08F *8/06*

U.S. Cl. 525—358 **14 Claims**



1. A process for preparing a fluorine-containing polymer having carboxyl groups, which comprises subjecting a solid fluorine-containing polymer having sulfonyl halide groups bonded thereto as pendant groups to an oxidation reaction at a temperature of 50° to 250° C. in the presence of a vapor of an organic compound at least having a carbon-hydrogen bond and an oxidizing agent in vapor form.

4,294,944

FLAME RETARDANT ANTISTATIC ADDITIVES AND ANTISTATIC FIBERS

David D. Newkirk, Beaverton, Oreg.; Robert B. Login, Middletown, Pa., and Basil Thir, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 746,723, Dec. 2, 1976, Pat. No. 4,229,554. This application Nov. 13, 1979, Ser. No. 94,032

Int. Cl.³ C08L *63/00*

U.S. Cl. 525—423 **7 Claims**

1. A flame-retardant, antistatic synthetic polymeric fiber which is the product of the process of dispersing in said fiber about 1 percent to about 12 percent by weight of a polymer composition which is the reaction product of a polyoxyalkylene compound with a halogenated aliphatic or aromatic diacid, anhydride or acid halide thereof or a diol.

2. The flame-retardant antistatic fiber of claim 1 wherein said fiber is a polyamide fiber.

4,294,945

REDUCTION OF SCALE FORMATION DURING VINYL CHLORIDE POLYMERIZATION WITH TIN MERCAPTIDES

Chung H. Wei, Bolton, Mass., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 21, 1980, Ser. No. 142,294

Int. Cl.³ C08F *2/44, 2/38, 2/18*

U.S. Cl. 526—74 **10 Claims**

1. A process for the suspension polymerization of vinyl chloride which comprises polymerizing vinyl chloride monomer in an aqueous suspension polymerization medium in the presence of an effective amount of a composition consisting essentially of an organotin mercaptide having the formula $R_mSn(SR')_{4-m}$, where m is an integer from 1 to 3, R_m is a hydrocarbon group, and R' is selected from the group consisting of R_m and $-C(O)R_m$, and an epoxidized vegetable oil, during a substantial portion of the reaction, to lessen the amount of polymer scale formation from the polymerization reaction.

4,294,946

LOW RESIDUAL MONOMER α-METHYLSTYRENE-ACRYLONITRILE COPOLYMERS AND ABS BLENDS THEREFROM

Hiroyuki Minematsu, Niihama; Kojiro Matsumoto, Takarazuka; Tadashi Saeki, and Akira Kishi, both of Niihama, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan

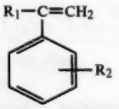
Continuation-in-part of Ser. No. 100,763, Dec. 6, 1979, abandoned. This application Jul. 21, 1980, Ser. No. 170,203

Claims priority, application Japan, Dec. 6, 1978, 53-151807; Dec. 6, 1978, 53-151808; Rep. of Korea, Dec. 6, 1979, 79-4310[U]

Int. Cl.³ C08F *2/22, 2/26*

U.S. Cl. 526—80 **6 Claims**

1. A process for preparing a thermoplastic resin having high heat resistance by emulsion polymerization of a monomer mixture consisting essentially of α-alkylstyrene compound of the formula:



wherein R_1 is C_1–C_3 alkyl and R_2 is hydrogen, C_1–C_3 alkyl or halo(C_1–C_3)alkyl and an unsaturated nitrile in a weight proportion of 65:35 to 80:20 in the presence of a radical initiator, characterized in that the whole amount of the α-alkylstyrene compound and 10 to 99% by weight of the unsaturated nitrile on the basis of its total amount are first subjected to polymerization and, after the polymerization, the remaining portion of the unsaturated nitrile is added to the reaction mixture and the resultant mixture is subjected to further polymerization until the polymerization is substantially completed.

4,294,947

PROCESS FOR THE PRODUCTION OF POWDERY, THERMOPLASTIC COPOLYMERS FROM ETHYLENE AND BUTENE-(1)

Klaus Doerk, Gladbeck; Klaus Koch, Kirchhellen; Horst Banke, Dorsten, and Bernhard Toben, Schermbeck, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Herne, Fed. Rep. of Germany

Filed Nov. 1, 1979, Ser. No. 90,408

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1978, 2847986

Int. Cl.³ C08F *2/14, 4/76*

U.S. Cl. 526—119 **17 Claims**

1. A process for the production of a copolymer of ethylene and butene-(1) which comprises:

copolymerizing a mixture of ethylene and butene-(1) at 50°–95° C. and 10–100 bar in the presence of a catalyst which comprises (1) the reaction product of a chlorine and/or alkoxy-containing vanadyl (V) compound and an organic aluminum compound selected from the group consisting of ethylaluminum dichloride, diethylaluminum chloride, isobutylaluminum dichloride, diisobutylaluminum chloride and mixtures thereof, and (2) an aluminum alkyl activating compound therefor selected from the group consisting of aluminum trialkyls, alkyl aluminum sesquichloride, alkyl aluminum dichloride, and mixtures thereof;

wherein the polymerization reaction is carried out in a solvent which comprises liquid butene-(1); thereby

obtaining a fluid powdery copolymer having a density up to about 0.930 g/cm³.

4,294,948

PROCESS FOR PREPARING OLEFIN POLYMERS OR COPOLYMERS, AND CATALYST FOR USE IN SAID PROCESS

Akinori Toyota, Iwakuni; Ken Yoshitugu, Ohtake, and Norio Kashiwa, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 880,584, Feb. 23, 1978, abandoned. This application Oct. 12, 1979, Ser. No. 84,317

Claims priority, application Japan, Mar. 4, 1977, 52-22754

Int. Cl.³ C08F *4/02, 10/06*

U.S. Cl. 526—125 **7 Claims**

1. A process for preparing an olefin polymer or copolymer by polymerizing or copolymerizing an olefin containing at least 3 carbon atoms which may contain at most 10 mole% of ethylene and/or a diene, at a temperature of about 0° to about 300° C., and a pressure of about 1 to about 7 kg/cm², in the presence of a catalyst composed of (A) a solid titanium catalyst component obtained by reacting a solid magnesium compound derived from (i) a halogen-containing magnesium compound, (ii) an active hydrogen-containing organic compound, (iii) an organic acid ester and (iv) an organometallic compound of metal of Groups II to III of periodic table, with a titanium compound, and (B) an organoaluminum compound; characterized in that the solid titanium catalyst component (A) is prepared by

(1) reacting a mechanically pulverized product of an aromatic carboxylic acid ester containing up to 20 carbon atoms, and a halogen-containing magnesium compound selected from the group consisting of magnesium dihalides, magnesium alkyl halides, magnesium alkoxy halides and magnesium phenoxy halides, said mechanically pulverized product being obtained by milling at a temperature of about 0° to about 100° C. during the period of about 1 hour to about 10 days, with an active hydrogen-

containing organic compound selected from the group consisting of aliphatic alcohols containing 1 to 8 carbon atoms, alicyclic alcohols containing 5 to 12 carbon atoms, aromatic alcohols containing 7 to 8 carbon atoms, and phenols containing 6 to 18 carbon atoms, in the absence of mechanical pulverization,

(2) reacting the resulting reaction product with an organometallic compound of a metal of Groups II to III of the periodic table selected from the group consisting of:

(a) organoaluminum compounds of the formula

$$R/mAl(OR^2)_nH_pX_q$$

wherein R^1 and R^2 are identical to, or different from, each other and represent an alkyl group containing 1 to 8 carbon atoms, X represents a halogen atom, m is more than 0 but not more than 3 ($0<m\leqq 3$), n is at least 0 but less than 3 ($0\leqq n<3$), p is at least 0 but less then 3 ($0\leqq p<3$), q is at least 0 but less than 3 ($0\leqq q<3$), and $m+n+p+q=3$, and

(b) compounds of the formula

$$R^1R^3M^2$$

wherein R^1 is as defined above, R^3 is the same as R^1 or represents a halogen atom, and M^2 represents magnesium, in the absence of mechanical pulverization, and

(3) washing the resulting solid reaction product with an inert organic solvent, reacting the washed solid reaction product with a titanium compound of the formula

$$Ti(OR)_rX_{4-r}$$

wherein R represents a hydrocarbon group, X represents a halogen atom, and r is a number of 0 to 4 ($0\leqq r\leqq 4$), in the absence of mechanical pulverization, and separating the solid from the reaction system, wherein the molar ratio of the organic acid ester and halogen-containing magnesium compound is from about 0.01 to 1 less than 1 to 1; the ratio of the mechanically pulverized product to the active hydrogen-containing organic compound is from about 0.01 to about 10 moles of organic compound per magnesium atom in the pulverized product; and the amount of the organometallic compound of a metal of Groups II to III of the periodic table is from about 0.01 moles to about 10 moles per mole of the active hydrogen-containing compound.

4,294,949

NOVEL POLYMERIC COMPOUNDS

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

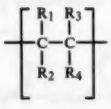
Continuation-in-part of Ser. No. 924,417, Jul. 13, 1978, Pat. No. 4,210,612. This application Jan. 25, 1980, Ser. No. 115,277

Claims priority, application Switzerland, Jul. 19, 1977, 8915/77

Int. Cl.³ C08F *226/06*

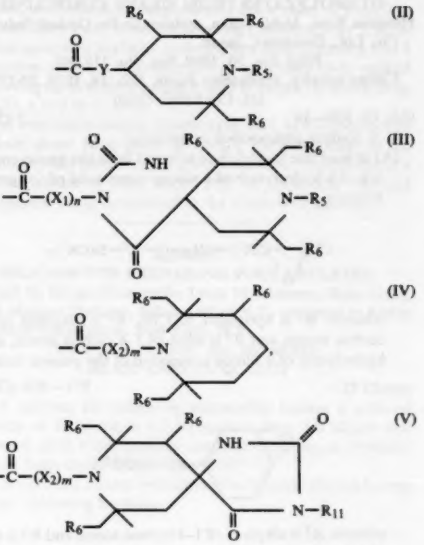
U.S. Cl. 526—262 **12 Claims**

1. A copolymer of a compound which carries N-heterocyclic rings in a side position and has the recurring structural unit of the formula I



(I)

in which R_1 is a group, containing an N-heterocyclic ring, of the formulae II, III, IV and V



(II)

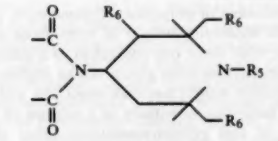
(III)

(IV)

(V)

in which R_5 is hydrogen, oxyl, C_1–C_{18} alkyl, 2-hydroxyethyl, 2-hydroxypropyl, C_3–C_8 alkenyl, C_3–C_6 alkynyl, C_7–C_{12} aralkyl, C_2–C_{21} alkoxyalkyl, an aliphatic acyl group having 1–4 C atoms or one of the groups $—CH_2COOR_7$ or $—COOR_8$, in which R_7 is C_1–C_{12} alkyl, C_3–C_8 alkenyl, phenyl, C_7–C_8 aralkyl or cyclohexyl and R_8 is C_1–C_{12} alkyl, phenyl, benzyl or cyclohexyl, and R_6 is hydrogen or C_1–C_4 alkyl and Y is —O— or

in which R_9 is hydrogen, C_1–C_{12} alkyl, C_7–C_{12} aralkyl or cyclohexyl, and X_1 is a group of the formula $—O—CH(R_{10})—CH_2—$ (VI) or denotes $—O—CH_2—CH_2—CH_2—$, in which R_{10} is hydrogen, methyl, ethyl, phenoxymethyl or phenyl, and n is 0 or 1, and X_2 is a group of the formula VI, in which R_{10} is as defined above, or a group of the formula $—O—CH_2—CH(OH)—CH_2—$ (VII), and m is 0 or 1, and R_{11} is C_1–C_{18} alkyl or is cyclohexyl, phenyl or benzyl which are unsubstituted or substituted by C_1–C_4 alkyl or C_1–C_4 alkoxy, and R_2 is hydrogen or C_1–C_4 alkyl, and, if R_2 and R_4 are hydrogen, R_1 and R_3 together form a group of the formula VIII



(VIII)

in which R_5 and R_6 are as defined above and R_3 is hydrogen or C_1–C_2 alkyl and R_4 is hydrogen or methyl, with a compound containing at least one polymerisable double bond, the molar ratio of the component of the formula I to the co-component being up to 1:10.

4,294,950

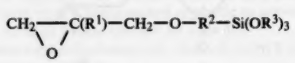
COATING COMPOSITION COMPRISING HYDROLYZATES FROM SILANE COMPOUNDS

Hirohisa Kato, Aichi, Japan, assignor to Ito Optical Industrial Co., Ltd., Gamagori, Japan

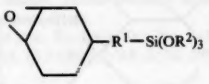
Filed Jan. 30, 1980, Ser. No. 116,946
Claims priority, application Japan, Feb. 16, 1979, 54-17716
Int. Cl.³ C08G *77/06*
U.S. Cl. 528—14 **7 Claims**

1. A coating composition comprising:

(A) at least one hydrolyzate selected from the group consisting of a hydrolyzate of a silicon compound of the general formula



wherein R^1 is hydrogen or CH_3, R^2 is alkylene of 1–4 carbon atoms, and R^3 is alkyl of 1–4 carbon atoms, and a hydrolyzate of a silicon compound of the general formula



wherein R^1 is alkylene of 1–4 carbon atoms and R^2 is alkyl of 1–4 carbon atoms;

(B) a compound selected from the group consisting of unsaturated and saturated polyvalent carboxylic acids and anhydrides thereof; and

(C) a curing agent.

4,294,951

RAPID CURING POLYURETHANE ELASTOMER PREPARED FROM A DIPHENYLMETHANEDIISOCYANATE BASED LIQUID PREPOLYMER AND A CURING AGENT CONTAINING A POLYTETRAMETHYLENE ETHER GLYCOL, A DIOL AND AN ORGANOMETALLIC CATALYST

Toshio Sugita, Yokohama; Hiroaki Sakaguchi, Ashiya; Hisanobu Tsuda, Kamakura, and Tsuyoshi Suzuki, Kawasaki, all of Japan, assignors to Mitsui-Nisso Corporation, Tokyo, Japan

Filed Jul. 14, 1980, Ser. No. 168,482
Int. Cl.³ C08G *18/72*
U.S. Cl. 528—55 **13 Claims**

1. A rapid curing polyurethane elastomer, said elastomer being prepared by a process comprising mixing:

A. a prepolymer which is liquid at room temperature and which is prepared by reacting:

1. about 4 to about 6 equivalents of a mixture of diphenylmethanediisocyanate and a carbodiimide modified material of said diisocyanate, said modified material being liquid at room temperature, with

2. about one equivalent of polytetramethylene ether glycol having a mean molecular weight of from about 650 to about 2000, or with about one equivalent of a mixture of said polytetramethylene ether glycol and an aliphatic diol having a molecular weight less than about 250, and

B. a curing agent consisting essentially of a mixture of about one equivalent of said polytetramethylene ether glycol, about one to about four equivalents of a diol having a molecular weight less than about 250 as a chain-elongating agent, and an organometallic catalyst,

the weight ratio of the prepolymer to the curing agent being such that the NCO/OH equivalent ratio is about 1.00 to about 1.10.

4,294,952

POLYAMIDE-IMIDE RESIN AND ITS PRODUCTION

Yoshiyuki Mukoyama, Hitachi, and Touichi Sakata, Katsuta, both of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Nov. 16, 1979, Ser. No. 94,938
Claims priority, application Japan, Nov. 30, 1978, 53-148820; Dec. 28, 1978, 53-164753; Mar. 22, 1979, 54-33921
Int. Cl.³ C08G *18/73, 18/74, 18/75, 18/76*
U.S. Cl. 528—67 **16 Claims**

1. A polyamide-imide resin obtained by reacting in a cresol type solvent a polyisocyanate containing isocyanurate rings, an aromatic diisocyanate, a lactam and a polycarboxylic acid containing at least one acid anhydride group at a temperature of 160° to 230° C., said polyisocyanate being used in an amount of 1 to 30 equivalent % based on the total isocyanate equivalent and said lactam being used in an amount of 20 to 80 equivalent % based on the total isocyanate equivalent; with the amounts of the isocyanate and the acid being 1.5 to 0.71/1 in terms of a ratio of the carboxyl group and the acid anhydride group to the isocyanate group.

4,294,953

PROCESS FOR PREPARING A BRANCHED POLYCARBONATE

Clayton B. Quinn, and William Hilakos, both of Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed May 31, 1979, Ser. No. 44,040
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—128 **7 Claims**

1. A process for producing a thermoplastic, randomly branched polycarbonate substantially free of cross-linking which consists essentially of reacting, at a pH of about 9 to 12, a carbonate precursor, a dihydric phenol, and a dianhydride branching agent, to thereby produce a thermoplastic randomly branched polycarbonate.

4,294,954

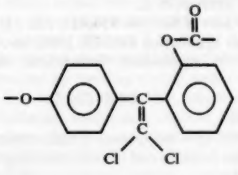
POLYCARBONATE COPOLYMERS

Charles M. Orlando, Schenectady, and George R. Loucks, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,215
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—174 **2 Claims**

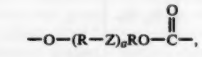
1. Polycarbonates consisting essentially of about

(a) 5 to 70 mole percent of carbonate units of the formula,



chemically combined with about

(b) 95 to 30 mole percent of carbonate units of the formula,



where R is a $C_{(6-13)}$ divalent aromatic organic radical, Z is a member selected from —S—, —O—,

and a $C_{(4-8)}$ cycloaliphatic radical and a is equal to 0 or 1.

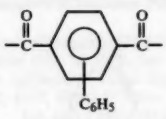
4,294,955

POLYMERS FROM PHENYLTEREPHTHALIC ACID

John F. Harris, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

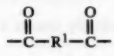
Filed Dec. 10, 1979, Ser. No. 102,040
Int. Cl.³ C08G 63/18
U.S. Cl. 528—176 7 Claims

1. A fiber forming melt-spinnable (co)polyester consisting essentially of units having the structural formulas



(1)

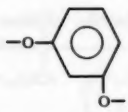
or a combination of (1) and up to 50 mol % of



(2)

wherein R^1 is 1,4-phenylene, 2,6-naphthalene, 4,4'-biphenylene or mixtures thereof, and

(3) —O—R^2—O— wherein R^2 is 1,4-phenylene, 2,6-naphthalene, 1,4-naphthalene, 4,4'-biphenylene or mixtures thereof or a combination of (3) with up to 20 mol % of



based on the total mols of dioxy units present.

4,294,956

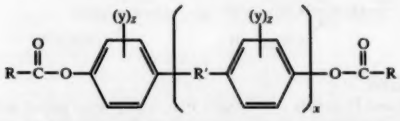
PROCESS FOR PREPARING POLYARYLATES IN THE PRESENCE OF A DIPHENYL ETHER

Mitchell H. Berger, Somerville; Peter J. Gill, North Brunswick, and Louis M. Maresca, Belle Mead, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 27, 1979, Ser. No. 69,818
Int. Cl.³ C08G 63/18, 63/28, 63/66
U.S. Cl. 528—179 17 Claims

1. A process for preparing a polyarylate having a reduced viscosity of from about 0.5 to greater than 1.0 gl/gm, which process comprises reacting:

(a) at least one diester derivative of a dihydric phenol having the following formula:



wherein R is independently selected from an alkyl radical having from 1 to about 6 carbon atoms, or cycloalkyl having from 4 to about 7 carbon atoms, y is independently selected from alkyl groups of 1 to 4 carbon atoms, chlorine, or bromine, z independently has a value of from 0 to 4, inclusive, and R' is independently selected from a divalent saturated aliphatic hydrocarbon radical having 1 to 8 carbon atoms, a cycloalkylene or cycloalkylidene radical having up to and including 9 carbon atoms, O, S, SO, SO_2, CO, x is 0 or 1; with

(b) at least one aromatic dicarboxylic acid, in the presence of from about 10 to about 60 weight percent, based on the polyarylate produced, of a diphenyl ether compound, at a temperature of from about 260° to about 350° C., said reaction being conducted in the absence of catalyst.

4,294,957

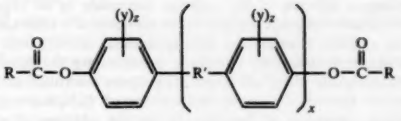
PROCESS FOR PREPARING POLYARYLATES

Mitchell H. Berger, Somerville; Louis M. Maresca, Belle Mead, and Markus Matzner, Edison, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 27, 1979, Ser. No. 69,819
Int. Cl.³ C08G 63/46, 63/18
U.S. Cl. 528—179 15 Claims

1. A process for preparing polyarylate having a reduced viscosity of from about 0.5 to greater than 1.0 dl/gm and improved color which process comprises reacting, at a temperature of from about 260° to about 350° C.:

(a) at least one diester derivative of a dihydric phenol having the following formula:



wherein R is independently selected from an alkyl radical having from 1 to about 6 carbon atoms or cycloalkyl having from 4 to about 7 carbon atoms, y is independently selected from alkyl groups of 1 to 4 carbon atoms, chlorine, or bromine, z independently has a value of from 0 to 4, inclusive, and R' is independently selected from a divalent saturated aliphatic hydrocarbon radical having 1 to 8 carbon atoms, a cycloalkylene, or cycloalkylidene radical having up to and including 9 carbon atoms, O, S, SO, SO_2, CO, x is 0 or 1; with

(b) at least one aromatic dicarboxylic acid, in the presence of from about 10 to about 60 weight percent, based on the polyarylate produced, of at least one cycloaliphatic, substituted aromatic or heteroaromatic compound, which compounds contain at least one benzylic and/or tertiary hydrogen atom, and have a boiling point of about 150° to about 350° C. at atmospheric pressure.

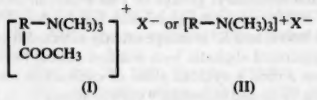
4,294,958

WATER-SOLUBLE SALTS OF TRIMETHYLAMMONIUM DERIVATIVES OF POLYENE MACROLIDE ANTIBIOTICS AND THE PREPARATION THEREOF

Leonard Falkowski, Gdansk; Barbara Stefanska, Gdansk-Oliwa; Jan Zielinski, Gdansk-Oliwa; Elzbieta Troka, Gdansk-Oliwa; Jerzy Golik, Sopot; Pawel Kolodziejczyk, Gdansk-Wrzeszcz; Andrzej Jarzebski, Gdansk; Emilia Cybulska, Gdansk-Oliwa, and Edward Borowski, Gdansk-Wrzeszcz all of Poland, assignors to Politechnika Gdanska, Gdansk, Poland

Filed Jul. 25, 1979, Ser. No. 60,427
Claims priority, application Poland, Jul. 19, 1978, 208519
Int. Cl.³ C07H 17/08
U.S. Cl. 536—17 R 4 Claims

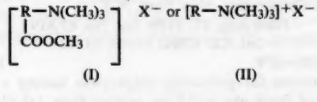
1. An antibiotically-active water-soluble salt of a trimethylammonium derivative of a polyene macrolide having the general formula:



(I) (II)

wherein R is the residue of a polyene macrolide selected from the group consisting of nystatin, polyfungin, amphotericin B, candicidin, pimaricin, trichomycin, levorin, rimocidin, candidin, aureofacin, perimycin and mycoheptin, and X is an anion of a salt selected from the group consisting of methylsulphate, sulphate, chloride, phosphate and acetate.

2. A process for the preparation of an antibiotically-active water soluble-salt of a trimethylammonium derivative of a polyene macrolide having the general formula:



(I) (II)

wherein R is the residue of a polyene macrolide selected from the group consisting of nystatin, polyfungin, amphotericin B, candicidin, pimaricin, trichomycin, levorin, rimocidin, candidin, auerofacin, perimycin and mycoheptin, and X is an anion of a salt selected from the group consisting of methylsulphate, sulphate, chloride, phosphate and acetate, which comprises reacting a solution of the polyene macrolide in an organic solvent with dimethylsulphate in the presence of a neutralizing agent at room temperature with continuous stirring until the reaction is substantially complete, precipitating the resulting methylsulphate of N,N,N-trimethyl polyene macrolide methyl ester of formula (I) or methylsulphate of N,N,N-trimethyl polyene macrolide of formula (II) by the addition of ethyl ether, dissolving the precipitate in butanol, washing the organic solvent with water and concentrating under reduced pressure the resulting solution of the desired product of formula (I) or (II) in the form of the methylsulphate salt thereof.

4,294,959

SELECTIVELY PROTECTED 4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS AND THEIR PRODUCTION

Eckart Voss, Cologne; Uwe Petersen, Leverkusen, and Peter Stadler, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

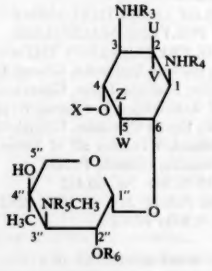
Filed Sep. 10, 1979, Ser. No. 74,047

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1978, 28409076

Int. Cl.[3] **C07H** *17/00, 15/22*

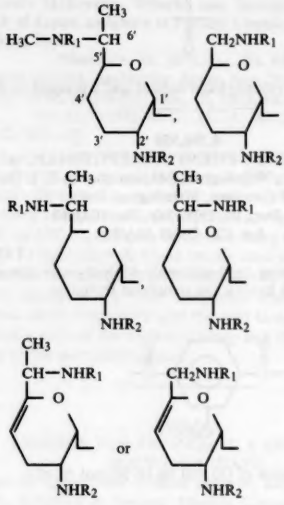
U.S. Cl. 536—17 R **11 Claims**

1. A compound of the formula



in which

X denotes a radical of the formula



U, V, W and Z independently denote a hydrogen atom or a hydroxyl group,

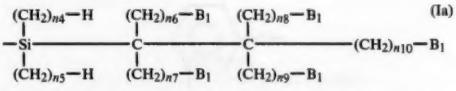
U, V, and W and Z not simultaneously denoting OH,

R_1, R_2, and R_3 denote —CO—A,

R_4 denotes a hydrogen atom,

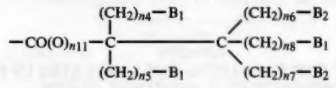
R_5 denotes a radical $—SR_7$ and

R_6 denotes a hydrogen atom or a space-filling substituent which can be split off of the formula



(Ia)

or



(Ib)

in which

n_4, n_5, n_6, n_7, n_8, n_9 and n_{10} are independently 0, 1, 2 or 3,

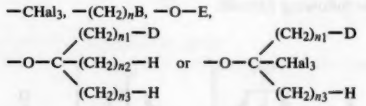
n_{11} is 0 or 1,

B_2 has any of the meanings given for B or denotes a C_1 to C_5 alkoxy or C_3 to C_5 alkenyloxy group and

B_1 has any of the meanings given for B,

and in which

A denotes a radical of the formulae



wherein

B and D denote a hydrogen atom or a phenyl group which is optionally monosubstituted or disubstituted by nitro, halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy or phenyl,

E denotes a phenyl group which is optionally monosubstitu-

ted or disubstituted by nitro, halogen, C_1 to C_4 alkyl, C_1 to C_4 alkoxy or phenyl,

n is 0, 1, 2, 3, 4 or 5,

n_1, n_2 and n_3 are independently 0, 1, 2, 3, 4 or 5,

Hal denotes a fluorine, chlorine or bromine atom and

R_7 denotes a phenyl, diphenylmethyl or triphenylmethyl group which is optionally monosubstituted to trisubstituted by CF_3, NO_2, C_1 to C_4 alkyl, C_1 to C_4 alkoxy- (C_1 to C_4 alkoxy)-carbonyl or phenyl or monosubstituted to pentasubstituted by halogen.

4,294,960

7-[2-(2-AMINOTHIAZOL-4-YL)-2-CYCLOPENTYLOXYIMINOACETAMIDO]-3-CEPHEM-4-CARBOXYLIC ACID (SYNISOMER)

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Toshiyuki Chiba, Iwami, and Kiyoshi Tsuji, Nagai-cho-naka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 886,340, Mar. 14, 1978. This application Feb. 21, 1980, Ser. No. 123,481

Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Nov. 11, 1977, 42315/77

Int. Cl.³ C07D *501/22*

U.S. Cl. 544—22 **1 Claim**

1. The compound 7-[2-(2-aminothiazol-4-yl)-2-cyclopentyloxyiminoacetamido]-3-cephem-4-carboxylic acid (syn isomer).

4,294,961

BENZOTHIAZINE 1,1-DIOXIDES

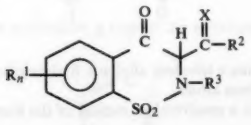
Ernest Spitzner, Minneapolis, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 7, 1980, Ser. No. 137,869

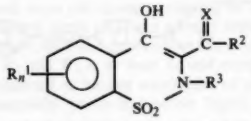
Int. Cl.³ C07D *279/02*

U.S. Cl. 544—49 **16 Claims**

1. Benzothiazine-1,1-dioxide compounds having in their 4-keto form, the structure



the corresponding enol of which has the structure:



wherein

X represents a radical selected from the group consisting of oxo and oxime;

R^1 and R^3 are hydrogen or an alkyl, alkenyl, aralkyl, alkaryl or alkenylaryl radical containing from 1 to about 20 carbon atoms;

n represents zero or an integer from 1 to 4;

R^2 is an alkyl, alkenyl, alkaryl or alkenylaryl radical containing from 1 to about 20 carbon atoms,

and provided that at least one of R^2 and R^3 contain at least 8 carbon atoms, said compounds being further characterized as having solubilities of at least 2% by weight in essentially water-immiscible liquid hydrocarbon solvents.

4,294,962

CONTINUOUS PROCESS FOR THE MANUFACTURE OF CYANURIC ACID

Elizabeth A. Bagnall, Morrisville, Pa.; Basil A. Guiliano, Plainsboro, and Henry A. Pfeffer, III, Mercerville, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 25, 1980, Ser. No. 162,718

Int. Cl.³ C07D *251/32*

U.S. Cl. 544—192 **15 Claims**

1. A continuous process for the manufacture of a substantially pure cyanuric acid by pyrolysis of a compound selected from the group consisting of urea and biuret dissolved in an inert solvent which comprises the steps of:

(a) circulating, at high velocity a reaction mixture comprising a solution of a compound selected from the group consisting of urea and biuret dissolved in an inert solvent through a loop between a heat exchanger and a forced circulation evaporative crystallizer body that contains a reservoir of the reaction mixture at the bottom thereof;

(b) introducing the circulating reaction mixture into the evaporative crystallizer body below the surface level of said reservoir in a manner to maximize the surface area of the reaction mixture as it enters the crystallizer;

(c) adding sufficient heat at the heat exchanger to maintain the circulating reaction mixture at a temperature within the range of about 180° C. to about 250° C.;

(d) crystallizing cyanuric acid from the reaction mixture as it circulates between the heat exchanger and the evaporative crystallizer body to form a slurry of cyanuric acid crystals;

(e) removing ammonia at a reduced pressure from the reaction mixture in the evaporative crystallizer body;

(f) removing a portion of the slurry of cyanuric acid crystals and the reaction mixture as it circulates;

(g) separating cyanuric acid crystals from said reaction mixture;

(h) returning the separated reaction mixture in the preceeding step to a feed tank;

(i) adding a compound selected from the group consisting of urea and biuret and an inert solvent to said feed tank to maintain the desired concentration of said compound in the reaction mixture, and

(j) adding the reaction mixture from the feed tank to the circulating reaction mixture to maintain the desired surface level in the evaporative crystallizer body.

4,294,963

POLYALKYLPIPERIDINE DERIVATIVES OF S-TRIAZINE

Jean Rody, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

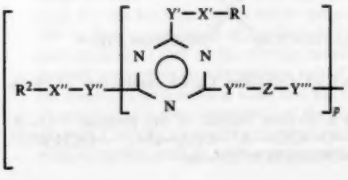
Continuation-in-part of Ser. No. 8,135, Jan. 31, 1979, abandoned. This application Jul. 16, 1979, Ser. No. 57,673

Claims priority, application Switzerland, Feb. 8, 1978, 1402/78

Int. Cl.³ C07D *401/12, 401/14*

U.S. Cl. 544—198 **5 Claims**

1. A compound of the formula



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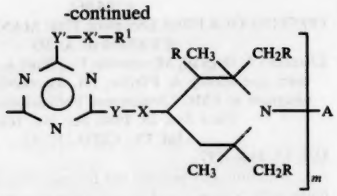
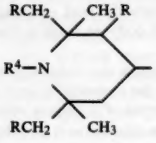
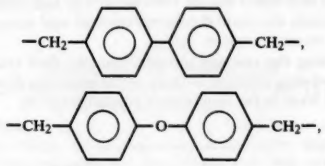


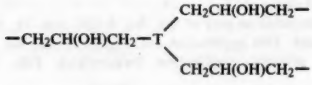
wherein m is 2, 3, or 4, p is 0 or 1, X, X′ and X″ represent a direct bond, C_1–C_4 alkylene or —$OCH_2CH_2CH_2$—, the O of which is not bonded to Y, Y′ or Y″; Y, Y′, Y″ and Y‴ represent —O—, —S—, —NH— or —NR^3—, Z represents C_2–C_{12} alkylene, C_4–C_{20} alkylene interrupted by —O—, —S—, —NH— or —NR^3—, xylylene, C_6–C_{12} arylene or -phenylene-Q′-phenylene-, wherein Q′ is —CH_2—, $>C(CH_3)_2$, —SO_2— or —O—, R represents hydrogen or C_1–C_4 alkyl, R^1, R^2 and R^3 represent C_1–C_{12} alkyl, C_2–C_8 alkoxyalkyl, C_2–C_4 hydroxyalkyl, C_5–C_{12} cycloalkyl, C_7–C_{12} aralkyl, C_3–C_{18} alkenyl, C_6–C_{10} aryl, phenyl which is substituted by (1) one or two C_1–C_8 alkyl groups, (2) hydroxy, (3) C_1–C_4 alkoxy, (4) one or two C_1–C_8 alkyl groups and hydroxy or (5) one or two C_1–C_8 alkyl groups and C_1–C_4 alkoxy, or represent a polyalkylpiperidinyl group of the formula



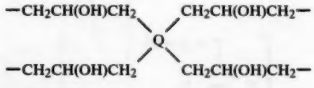
R^4 represents hydrogen, O, C_1–C_{12} alkyl, allyl or benzyl,
A if m is 2, represents C_2–C_{12} alkylene, xylylene or a radical of the formula —CH_2—C≡C—CH_2—,



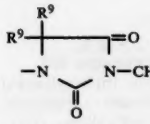
—CH_2—COO—R^5—OOC—CH_2—, —CH_2—CH(OH)—CH_2— or —$CH_2CH(OH)CH_2$—D—$CH_2CH(OH)CH_2$—, or if m is 3, represents a group of the formula

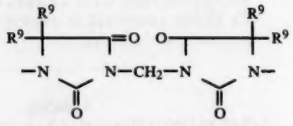


and, if m is 4, represents a group of the formula

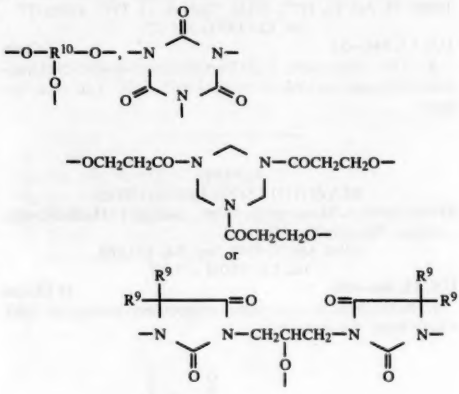


R^5 represents C_2–C_8 alkylene, C_4–C_8 oxaalkylene or cyclohexylene,
D represents a divalent radical of the formula —O—R^6—O—, —O—C(O)—R^7—C(O)—O—, —$OCH(R^8)CH_2O$—R^6—$OCH_2CH(R^8)O$— or

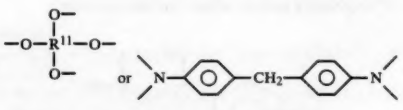




R^6 represents C_2–C_{12} alkylene, C_6–C_{12} cycloalkylene, C_6–C_{12} arylene or -phenylene-Z_1-phenylene-, wherein Z_1 represents —CH_2—, $>C(CH_3)_2$, —SO_2— or —O—,
R^7 represents a direct bond, C_1–C_{12} alkylene or C_6–C_{12} arylene,
R^8 and R^9 are hydrogen or C_1–C_4 alkyl,
T represents a trivalent radical of the formulae



R^{10} represents a trivalent aliphatic hydrocarbon radical of 3 to 10 carbon atoms,
Q represents a quadrivalent radical of the formula



and
R^{11} represents a quadrivalent aliphatic hydrocarbon radical of 4 to 10 carbon atoms.

4,294,964

2-ARYL-1H-PERIMIDINES

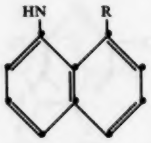
Ken Matsumoto, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 944,434, Sep. 21, 1978, Pat. No. 4,224,326, which is a continuation-in-part of Ser. No. 861,732, Dec. 19, 1977, abandoned. This application Feb. 28, 1980, Ser. No. 125,738

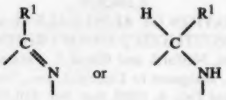
Int. Cl.[3] **C07D** *239/70;* **A61K** *31/505*

U.S. Cl. 544—249 **4 Claims**

1. A compound of the formula



or a pharmaceutically-acceptable salt thereof, wherein R represents



and R^1 represents m- or p- R^2 phenyl wherein R^2 represents $-CF_3$, $-OCF_3$, $-SCF_3$, or $-OC_2F_5$.

4,294,965

BENZENE SULFONAMIDO PYRIMIDINE DERIVATIVES

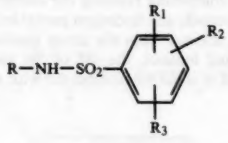
Michael J. Virnig, Fridley, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Division of Ser. No. 909,225, May 24, 1978, Pat. No. 4,210,759. This application Jan. 31, 1980, Ser. No. 117,229

Int. Cl.³ C07D *239/69*

U.S. Cl. 544—297 **8 Claims**

1. Compounds of the structure:



wherein R is a pyrimidine group of the structure:

and wherein R_1, R_2 and R_3, which may be the same or different, are selected from the group consisting of hydrogen and linear and branched chain alkyl and alkenyl containing from 1 to 20 carbon atoms, with the proviso that the sum of the carbon atoms in R_1, R_2 and R_3 is at least 8, said compounds being further characterized as having solubilities of at least 2% by weight in essentially water-immiscible liquid hydrocarbon solvents.

4,294,966

PROCESS FOR INVERTING THE CONFIGURATION IN OPTICALLY ACTIVE COMPOUNDS

Janos Zergenyi, Seltisberg, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

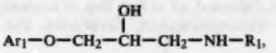
Filed Jul. 16, 1979, Ser. No. 58,222

Claims priority, application Switzerland, Jul. 28, 1978, 8145/78

Int. Cl.³ C07D *239/24, 241/10*

U.S. Cl. 544—316 **1 Claim**

1. A process for inverting the configuration in an optically active compound of the formula

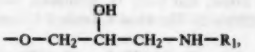


(I)

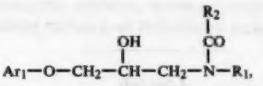
in which

Ar_1 represents 1-naphthyl, 3-lower alkylphenyl, 2-lower alkenylphenyl, 2-lower alkenyloxyphenyl, 4-lower alkanoylaminophenyl, 4-(2-lower alkoxy ethyl)-phenyl, pyrazin-2-yl, pyrimidin-2-yl, (1-pyrryl)-phenyl, 4-indolyl, 5-(2-lower alkoxy carbonylamino ethyl)pyridyl, 3-cyanopyridyl, 4-(benzimidazol-2-on)-yl, 4-(N'-cycloalkylureido)-phenyl, benzyloxyphenyl or hydroxyphenyl,

R_1 represents lower alkyl, phenyl-lower alkyl or phenoxy-lower alkyl, said compound of the formula I or R(+) configuration being converted into one of S(−) configuration, or said compound of the formula I of S(−) configuration being converted into one of R(+) configuration, said configuration inversion being concerned with the secondary alcohol group being present in the group

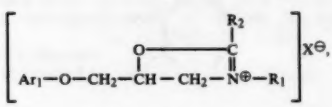


which comprises converting an optically active compound of the formula



(II)

having a R(+) or S(−) configuration, in which R_2 represents lower alkyl, phenyl-lower alkyl, phenoxy-lower alkyl or phenyl, and Ar_1 and R_1 have the meaning given, by treating with concentrated phosphoric acid or concentrated sulphuric acid for two hours in a temperature range of from approximately 50° to 200°, or with a chloride or bromide of such acids for 45 minutes in a temperature range of from −10° to 70° into an optically active compound of the formula



(III)

wherein $X^{\ominus}$ represents the anion of phosphoric acid or sulphuric acid or of chlorine or bromine, and hydrolysing a resulting compound of the formula III, optionally by way of the corresponding free base as intermediate, with aqueous mineral acids for 1-2 hours in a temperature range of from 0° to 120°, or with aqueous alkaline solutions for one hour in a temperature range of from 50° to 150° to form a compound of the formula I of a configuration opposite to that of the starting material used and, if desired, converting an acid addition salt of a compound of the formula I with mineral acids into the free compound, or converting a free compound of the formula I into a pharmaceutically acceptable, non-toxic acid addition salt with inorganic acids or with organic acids.

4,294,967

N-ACYL-PIPERIDONE COMPOUNDS

Hans-Jochem Riebel, Wuppertal; Ludwig Eue, Leverkusen, and Wilfried Faust, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

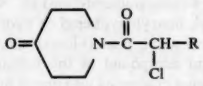
Filed Sep. 8, 1980, Ser. No. 184,728

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938155

Int. Cl.³ C07D *217/74;* **A01N** *43/40*

U.S. Cl. 546—242 **3 Claims**

1. An N-Acyl-piperidone of the formula



(I)

wherein R is methyl or chloro.

4,294,968

METHOD FOR PREPARING α-PICOLINE FROM 5-OXOHEXANENITRILE

Frederick C. Stone, and Gary G. Schupska, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 53,635, Jun. 29, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,512

Int. Cl.³ C07D *213/08, 213/09*

U.S. Cl. 546—251 **4 Claims**

1. In a method of preparing α-picoline comprising contacting under dehydrogenation conditions 5-oxohexanenitrile with a palladium dehydrogenation catalyst, the improvement wherein the catalyst is palladium on a carbon support.

4,294,969

PROCESS FOR PRODUCING 2-BROMO-3,5-DISUBSTITUTED PYRIDINES

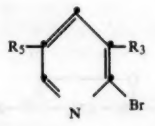
John J. Baldwin, and Gerald S. Ponticello, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 7,092, Jan. 29, 1979, which is a continuation-in-part of Ser. No. 866,961, Jan. 4, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 167,577

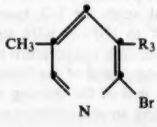
Int. Cl.³ C07D *213/55, 213/57*

U.S. Cl. 546—286 **2 Claims**

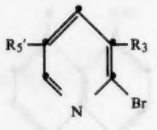
1. A process for preparing compounds of the formula



wherein R_3 is $COOC_2H_5$ or CN and R_5 is CHO or $—COOC_2H_5$ which comprises (1) reacting a compound of the formula



with N-Bromosuccinimide in the presence of a peroxide and U.V. light and (2) hydrolyzing the resultant compound of the formula



where R_5, is $—CH_2Br$, $—CHBr_2$ or CBr_3 using $AgNO_3$.

4,294,970

OXIDATION OF ALPHA-ALKYLATED, BENZYL-SUBSTITUTED 2-THIOPYRIDINE 1-OXIDES

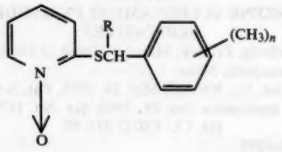
Howard L. Plant, Milford, and Glenn S. Peterson, Watertown, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 4, 1980, Ser. No. 118,175

Int. Cl.³ C07D *213/62*

U.S. Cl. 546—294 **10 Claims**

1. A method of oxidizing alphaalkylated, benzyl-substituted 2-thio pyridine 1-oxides having the general formula



where R is alkyl having from 1 to 8 carbon atoms and n is 1 or 2, said method comprising reacting the compound to be oxidized with acetonitrile and hydrogen peroxide in a solvent for said compound selected from the group consisting of methanol, propanol and butanol, the pH of the reaction mixture being maintained at about 9.0 to about 9.5 with a metal hydroxide.

4,294,971

PREPARATION OF N-ARYLOXAZOLIDINE-2,4-DIONES

Franz Merger, Frankenthal, and Friedrich Towae, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

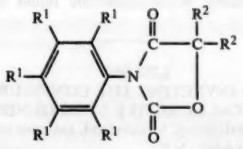
Filed Mar. 6, 1980, Ser. No. 127,759

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913522

Int. Cl.³ C07D *263/04*

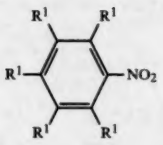
U.S. Cl. 548—226 **10 Claims**

1. A process for the preparation of an N-aryloxazolidine-2,4-dione of the formula



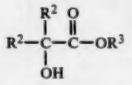
I

where the individual radicals R^1 and R^2 may be identical or different and each is hydrogen or an aliphatic, cycloaliphatic, araliphatic or aromatic radical, the two radicals R^2 may also together be a methylene radical and R^1 may also be halogen or $—X—R^3$, where R^3 is an aliphatic radical and X is oxygen or sulfur, wherein a nitrobenzene of the formula



II

where R^1 has the above meaning, is reacted with a 2-hydroxycarboxylic acid ester of the formula



III

where R^2 and R^3 have the above meanings, and with carbon monoxide in the presence of selenium and a basic compound under superatmospheric pressure at an elevated temperature.

4,294,972

1,2-DISUBSTITUTED OXO TRIAZOLIDINE

Frederick Cassidy, and Alexander C. Goudie, both of Harlow, England, assignors to Beecham Group Limited, England

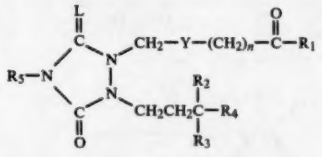
Filed Jun. 14, 1979, Ser. No. 48,390

Claims priority, application United Kingdom, Jun. 15, 1978, 27060/78

Int. Cl.³ A61K *31/41;* C07D *249/12*

U.S. Cl. 548—264 **14 Claims**

1. A compound of the formula:



and salts thereof wherein

n is 4;

Y is $-CH_2CH_2-$;

L is O or S:

R_1 is alkyl of from 1 to 4 carbon atoms;

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms;

R_3 is hydroxy;

R_4 is alkyl of 1 to 9 carbon atoms; and

R_5 is alkyl of 1 to 6 carbon atoms.

4,294,973

PROCESS FOR THE PREPARATION OF DIACYLATED 4-IMIDAZOLIN-2-ONES

Karl-Heinz Scholz; Willy Hartmann, and Hans-Georg Heine, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

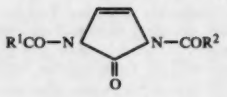
Division of Ser. No. 884,520, Mar. 8, 1978, Pat. No. 4,238,618. This application Dec. 10, 1979, Ser. No. 101,610

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713431

Int. Cl.³ C07D *233/70*

U.S. Cl. 548—320 **6 Claims**

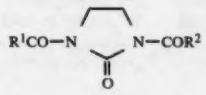
1. A process for the preparation of a diacylated 4-imidazolin-2-one of the formula



wherein

R^1 and R^2 independently represent hydrogen, alkyl, which can be substituted by a C_{1-2} alkoxy radical or a halogen, cycloalkyl which can be C_{1-4} alkyl substituted, aryl which can be C_{1-4} alkyl or C_{1-2} alkoxy or halogen substituted or alkoxy, the alkyl, cycloalkyl, aryl or alkoxy groups representing

R^1 and R^2 having up to 10 carbon atoms, which comprises contact a compound of the formula



wherein

R^1 and R^2 have the previously assigned significance with an equimolar amount of chlorine or sulphuryl chloride at a temperature from 20° to 150° C. in the presence of a peroxide, peracid ester or azoalkane radical forming agent or under ultra-violet light to monohalogenate the same and thereafter dehydrohalogenating the resultant monohalogenated product by:

A. Subjecting the monochlorinated product to a temperature of 100° to 250° C. at reduced pressure; or

B. contacting the same with a tertiary amine.

4,294,974

HYDROPHILIC SILICONE COMPOUNDS AND CONTACT LENSES CONTAINING POLYMERS THEREOF

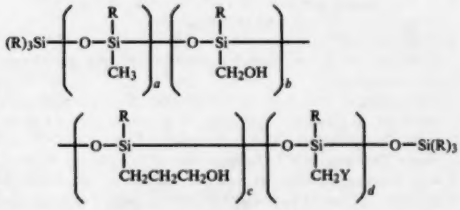
Albert R. LeBoeuf, Framingham, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 8,301, Jan. 31, 1979, Pat. No. 4,261,875. This application Dec. 17, 1979, Ser. No. 104,259

Int. Cl.³ C07F *7/08, 7/18*

U.S. Cl. 556—440 **11 Claims**

1. A hydrophilic siloxane having the formula:



wherein R is an alkyl having 1 to 3 carbons, a+b+c+d=e, b=0 to e, c=0 to e, b+c>1, d=1 to 5, e=1 to 100, and Y is an organic group containing at least one >C=C<.

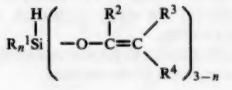
4,294,975

HYDROALKENYLOXYSILANES

Toshio Takago; Masatoshi Arai, and Koji Futatsumori, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed May 20, 1980, Ser. No. 151,696
Claims priority, application Japan, May 31, 1979, 54/67706
Int. Cl.³ C07F *7/04, 7/18*
U.S. Cl. 556—482 **5 Claims**

1. A hydrogenalkenyloxysilane represented by the general formula



in which R^1 is a monovalent hydrocarbon group having from 1 to 8 carbon atoms, R^2, R^3 and R^4 are each independently a hydrogen atom or a monovalent hydrocarbon group having from 1 to 8 carbon atoms and n is a number of zero, 1 or 2.

4,294,976

PROCESS FOR PRODUCING BIPHENYL COMPOUNDS

Hiroshi Itatani, Chiba; Hataaki Yoshimoto, Ichihara; Akinori Shiotani, Ichihara; Akiyoshi Yokota, Ichihara, and Motozoh Yoshikiyo, Ichihara, all of Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Aug. 31, 1979, Ser. No. 71,089
Claims priority, application Japan, Sep. 5, 1978, 53/108097
Int. Cl.³ C07C *69/76, 179/02, 15/14*
U.S. Cl. 560—76 **11 Claims**

1. A process for producing a biphenyl compound, comprising dehydrogenatively dimerizing an aromatic monocyclic compound selected from the group consisting of benzene and substituted benzene compounds having 1 to 4 substituents attached to the benzene ring thereof, with molecular oxygen in the presence of oxalic acid together with a catalyst comprising at least one organic palladium salt, under a pressurized condition, and, isolating the resulting biphenyl compound from the reaction mixture.

4,294,977

PROCESS FOR PRODUCING AROMATIC CARBOXYLIC ACIDS

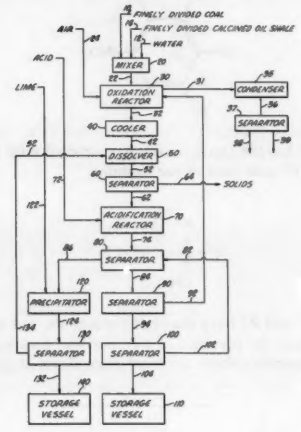
Raymond A. Schep, Newport Beach, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Continuation of Ser. No. 883,933, Mar. 6, 1978, abandoned. This application Sep. 24, 1979, Ser. No. 78,401
Int. Cl.³ C07C *51/21*
U.S. Cl. 562—407 **27 Claims**

8. A process for producing benzene carboxylic acid from coal comprising:

a. treating in an oxidation zone a mixture of coal, water, and calcined oil shale with oxygen, at a temperature of from about 200° to about 350° C., a pressure of from about 250 to about 2000 psig, and a reaction time of from about 10 minutes to about 3 hours, wherein the amount of said calcined oil shale is about 1 to about 10 parts by weight of said calcined oil shale per part by weight of said coal, to convert said coal to a benzene carboxylic acid salt thereby producing a second mixture containing dissolved therein said benzene carboxylic acid salt;

b. removing solids comprising said calcined oil shale from said second mixture thereby producing a solution;



c. treating said solution with an acid to convert said benzene carboxylic acid salt dissolved therein to a benzene carboxylic acid; and

d. recovering said benzene carboxylic acid thusly formed.

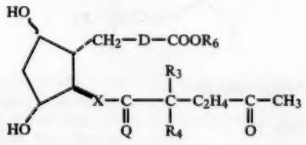
4,294,978

13,14-DIDEHYDRO-19-OXO-PGF$_2$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,000
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—, or
(4) trans—$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,

(n) $—CH_2—CO—R_{28}$,
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is $—C\equiv C—$.

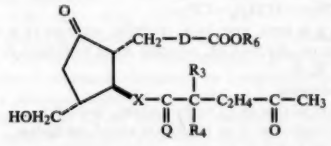
4,294,979

13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGE_2 COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,005
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis—CH_2—CH=CH—CH_2—CH_2—, or
(4) trans—$(CH_2)_3$—CH=CH—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g)—(p-Ph)—CO—CH_3,
(h)—(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i)—(p-Ph)—NH—CO—(p-Ph),
(j)—(p-Ph)—NH—CO—CH_3,
(k)—(p-Ph)—NH—CO—NH_2,
(l)—(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n)—CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is $—CH_2CH_2—$.

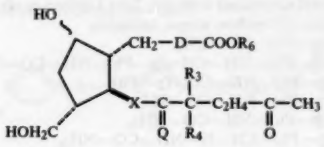
4,294,980

13,14-DIHYDRO-11-DEOXY-11-HYDROXYMETHYL-19-OXO-PGF_1 COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,010
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is $—CH_2CH_2—$.

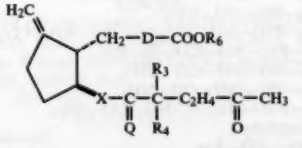
4,294,981

13,14-DIDEHYDRO-11-DEOXY-9-DEOXY-9-METHYLENE-19-OXO-PGF_1 COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,035
Int. Cl.³ C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is

(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

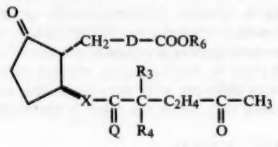
4,294,982

13,14-DIDEHYDRO-11-DEOXY-19-OXO-PGE$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,036
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is zero, one, two, or three; wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p—Ph)—CO—CH_3,
(h) —(p—PH)—NH—CO—(p—Ph)—NH—CO—Ch$_3$,
(i) —(p—Ph)—NH—CO—(p—Ph),
(j) —(p—Ph)—NH—CO—CH_3,
(k) —(p—Ph)—NH—CO—NH_2,
(l) —(p—Ph)—CH=N—NH—CO—NH_2,
(m) β—naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p—Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and wherein X is —C≡C—.

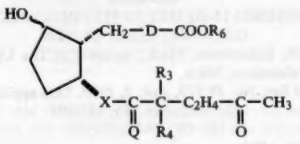
4,294,983

13,14-DIDEHYDRO-11-DEOXY-19-OXO-PGF$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 20, 1980, Ser. No. 132,037
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is zero, one, two, or three; wherein Q is α—OH:β—R_5 or α—R_5:β—OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g) —(p-Ph)—CO—CH_3,
(h) —(p-Ph)—NH—CO—(p-Ph)—NH—CO—CH_3,
(i) —(p-Ph)—NH—CO—(p-Ph),
(j) —(p-Ph)—NH—CO—CH_3,
(k) —(p-Ph)—NH—CO—NH_2,
(l) —(p-Ph)—CH=N—NH—CO—NH_2,
(m) β-naphthyl,
(n) —CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene, wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and wherein X is —C≡C—.

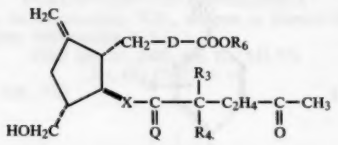
4,294,984

13,14-DIDEHYDRO-11-DEOXY-11-HYDROXYMETHYL-9-DEOXY-9-METHYLENE-19-OXO-PGF$_1$ COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 25,879, Apr. 2, 1979. This application Mar. 20, 1980, Ser. No. 132,038
Int. Cl.^{3} C07C *177/00*
U.S. Cl. 562—503 **4 Claims**

1. A compound of the formula



wherein D is
(1) $(CH_2)_3$—$(CH_2)_g$—CH_2—, or
(2) $(CH_2)_3$—$(CH_2)_g$—CF_2—;
wherein g is zero, one, two, or three;
wherein Q is α-OH:β-R_5 or α-R_5:β-OH, wherein R_5 is hydrogen or methyl;
wherein R_6 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl groups of one to 3 carbon atoms, inclusive,
(g)—(p—Ph)—CO—CH_3,
(h)—(p—Ph)—NH—CO—(p—Ph)—NH—CO—CH_3,
(i)—(p—Ph)—NH—CO—(p-Ph),
(j)—(p—Ph)—NH—CO—CH_3,
(k)—(p—Ph)—NH—CO—NH_2,
(l)—(p—Ph)—CH=N—NH—CO—NH_2,
(m) β—naphthyl,
(n)—CH_2—CO—R_{28},
wherein (p-Ph) is para-phenyl or inter-para-phenylene,
wherein R_{28} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, or
(o) a pharmacologically acceptable cation;
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein X is —C≡C—.

4,294,985

PRODUCTION OF THIOCARBOHYDRAZIDE ON A COMMERCIAL SCALE

Günther Cramm, Cologne, and Karl H. Blöcher, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 856,455, Nov. 30, 1977, abandoned. This application Jun. 15, 1979, Ser. No. 48,856

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658557

Int. Cl.³ C07C *159/00*

U.S. Cl. 564—18 **3 Claims**

1. In the production of thiocarbohydrazide by reacting hydrazine hydrate with carbon disulphide in the presence of water to form in a first stage hydrazinium dithiocarbazinate, subsequently thermally decomposing the hydrazinium dithiocarbazinate in a second stage to form thiocarbohydrazide, and recovering the thiocarbohydrazide from the reaction medium, the improvement which comprises effecting the entire reaction in the mother liquor of a preceding batch, carrying out the first reaction stage at a temperature between about 25° C. and 45° C., with injection of carbon disulphide below the surface of the reaction mixture carrying out the second stage at about 62° to 65° C. without prior isolation of the intermediate product; subsequently cooling the reaction mixture to about 20° to 25° C. and filtering off the thiocarbohydrazide formed, separating the amount of mother liquor in excess of that required for the next batch, and feeding the balance of the mother liquor to the next batch.

4,294,986

NOVEL PARA-PHENYLALKOXY PHENYLUREA AND THIOUREA COMPOUNDS AND HERBICIDAL USE THEREOF

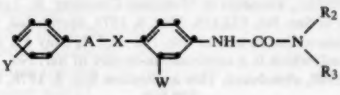
David M. Spatz, San Francisco, Calif., and Barrington Cross, Rocky Hill, N.J., assignors to American Cyanamid Co., Stamford, Conn.

Division of Ser. No. 51,584, Jun. 25, 1979. This application Apr. 24, 1980, Ser. No. 143,223

Int. Cl.³ C07C *127/19*; A01N *9/20*

U.S. Cl. 564—52 **7 Claims**

1. A compound of the formula:



wherein R_2 and R_3 each represent alkyl C_1–C_4 or alkoxy C_1–C_4; X is oxygen; A is a straight or branched, unsaturated, alkyl C_2–C_8 group; W is hydrogen or chlorine; and Y is hydrogen, halogen, alkyl C_1–C_4 or alkoxy C_1–C_4.

4,294,987

PROCESS FOR PREPARING METHYLENE DIANILINES

Richard A. Prather, and Nirad N. Shah, both of Houston, Tex., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 31, 1979, Ser. No. 108,522

Int. Cl.³ C07C *85/145*

U.S. Cl. 564—331 **8 Claims**

1. In a process for the preparation of a mixture of di(aminophenyl)methane and oligomeric polymethylene polyphenyl polyamines the steps comprising:
reacting aniline and formaldehyde in a proportion of about 1.6 moles to about 8 moles of aniline per mole of formaldehyde in the presence of an acid catalyst at a temperature in the range of about 0° C. to about 55° C. until the formation of aminobenzylamines is substantially complete;
adjusting, if necessary, the proportions of aniline and water in the resulting reaction mixture so that the molar proportion of aniline to formaldehyde originally present in the reaction mixture is at least 4:1 and the amount of water is such that the concentration of acid catalyst is in the range of about 1 to about 8 percent by weight based on the total weight of the reaction mixture;
subjecting the resulting aqueous solution to extraction with an inert organic solvent;
separating the solvent and aqueous layers;
removing the solvent from said solvent extract by distillation under reduced pressure;
subjecting the residual mixture of amines to rearrangement to the corresponding mixture of di(aminophenyl)methane and oligomeric polymethylene polyphenyl polyamines by heating at a temperature in the range of about 60° C. to about 115° C. in the presence of a catalyst selected from the class consisting of strong acids, diatomaceous earth, clay and zeolite, provided that, when a strong acid is employed as catalyst, it is present in an amount substantially less than that employed in the initial condensation of the aniline and formaldehyde.

4,294,988

METHOD OF PREPARING 2,4-DIFLUOROANILINE

Roger J. Tull, Metuchen; Leonard M. Weinstock, Bellemead, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 31, 1977, Ser. No. 847,187

Int. Cl.³ C07C *85/11*

U.S. Cl. 564—417 **8 Claims**

1. A method of preparing 2,4-difluoroaniline comprising the steps of

(a) reacting 2,4,5-trichloronitrobenzene under anhydrous conditions with a fluorinating agent selected from NaF, KF, CsF, C_{1-4} alkyl quaternary ammonium fluoride, and mixtures thereof, to form 2,4-difluoro-5-chloronitrobenzene; and

(b) hydrogenating the 2,4-difluoro-5-chloronitrobenzene with hydrogen in the presence of a catalyst to form 2,4-difluoroaniline.

4,294,989

METHYLCYCLOHEXYL-O-ANISYLPHOSPHINE

William S. Knowles, St. Louis, and Milton J. Sabacky, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 122,116, Mar. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 36,471, May 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 758,603, Sep. 9, 1968, abandoned. This application Sep. 5, 1978, Ser. No. 939,568

Int. Cl.³ C07F *9/50*

U.S. Cl. 568—13 **1 Claim**

1. Methylcyclohexyl-o-anisylphosphine.

4,294,990

ALKYL-POLYGLYCOL MIXED FORMALS AS FIBER PREPARATION AGENTS

Rolf Kleber, Neu-Isenburg, and Siegfried Billenstein, Burgkirchen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,978

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812443

Int. Cl.³ D06M *13/18*

U.S. Cl. 568—601 **2 Claims**

1. A polyglycol ether mixed formal of the formula

$$R_1—(OC_2H_4)_n—OCH_2OCH_2CH_2OR_2$$

in which R_1 is a linear or branched alkyl or alkenyl radical of from 8 to 22 carbon atoms, R_2 is a linear alkyl radical of from 1 to 4 carbon atoms and n is an integer of from 3 to 30.

4,294,991

PROCESS FOR MONOALKYLATION OF DIHYDRIC PHENOLS

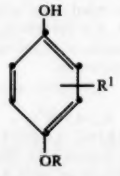
Michael Bellas, Wigan, and Robert Cahill, Kirkby, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 904,683, May 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 748,036, Dec. 6, 1976, abandoned. This application Sep. 24, 1979, Ser. No. 78,123

Int. Cl.³ C07C *43/178, 43/00*

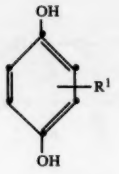
U.S. Cl. 568—650 **16 Claims**

1. A process for the preparation of a monoalkyl ether having the formula



I

wherein R is an alkyl radical having 1 to 18 carbon atoms or $C_2H_5—O—CH_2CH_2—$ and R^1 is hydrogen or an alkyl radical having 1 to 4 carbon atoms, which comprises reacting a compound having the formula R-OH with a mixture of a compound having the formula



II

and a compound having the formula

III

in the presence of an acid dehydration catalyst, wherein the weight ratio of II:III is from 5:1 to 20:1.

4,294,992

PROCESS FOR THE PRODUCTION OF ALKYL ARYL ETHERS

Graham K. Hughes, Hackettstown, N.J., assignor to The Southland Corporation, Dallas, Tex.

Filed Jan. 23, 1980, Ser. No. 114,601

Int. Cl.³ C07C *43/205*

U.S. Cl. 568—632 **8 Claims**

1. A process for the production of an alkyl aryl ether comprising incrementally reacting an acid and an alkanol with a phenol at a rate of about 0.907–0.133 weight percent per minute of the acid and alcohol based on the weight of the phenol and continuously removing water formed as a by-product of said reaction, said reaction being carried out at an elevated temperature.

4,294,993

PURIFICATION OF BISPHENOL-A

Ming K. Li, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 14, 1980, Ser. No. 139,969

Int. Cl.³ C07C *37/70*

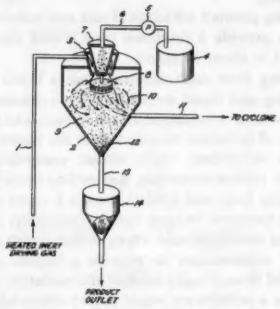
U.S. Cl. 568—724 **5 Claims**

1. The method of recovering 2,2-bis(4-hydroxyphenyl) propane in a purified state from a mixture of the latter and impurities therein derived from the acid condensation of phenol and acetone, which process comprises (1) combining a mixture of (a) a preformed isolated adduct of phenol and the above-identified dihydroxydiphenyl propane and (b) impurities associated with (a), with sufficient toluene alone or with a mixture of toluene and water to form a homogeneous solution with the toluene, or a liquid-liquid mixture when water and toluene are used, the toluene being employed, on a weight basis, from 0.5 to 10 parts toluene per part adduct, (2) heating the mixture at a temperature of from 45°–125° C., (3) cooling the solution or liquid-liquid mixture to a temperature where the aforesaid dihydroxydiphenyl propane precipitates in a highly purified state, and (4) isolating the purified 2,2-bis(4-hydroxyphenyl) propane.

4,294,994
PURIFICATION OF BISPHENOL-A

Ming K. Li, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 21, 1980, Ser. No. 141,778
Int. Cl.³ C07C 37/70
U.S. Cl. 568—724 4 Claims



1. The method of recovering 2,2-bis(4-hydroxyphenyl) propane in a highly purified state which comprises subjecting a preformed isolated adduct of the aforesaid dihydroxydiphenyl propane and phenol containing at least 0.05%, by weight, of said adduct of acetone, to spray drying conditions at a temperature of from 50°–150° C. whereby the adduct is converted to the purified dihydroxydiphenyl propane and is recovered in a highly purified state and the acetone and phenol thereby produced are separately recovered.

4,294,995
METHOD AND CATALYST FOR MAKING BISPHENOL

Gary R. Faler, and George R. Loucks, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,095
Int. Cl.³ C07C 37/00; C08F 112/08
U.S. Cl. 568—728 2 Claims

1. In a method of making bisphenol, based on the reaction between a ketone and a phenol in the presence of an effective amount of a sulfonated polystyrene cation-exchange resin in acid form modified by the neutralization of 5–25% of a cation-exchange capacity with a promoter in the form of a C_2–C_4 alkyl mercapto amine whereby the promoter is incorporated onto the cation-exchange resin backbone by an acid-amine salt ionic bond which is susceptible to excessive loss from the cation-exchange resin due to leaching as the result of the degradation of the acid-amine salt ionic bond during the use of the ion-exchange resin in phenol-ketone condensation reaction, the improvement which comprises utilizing as the cation-exchange resin, a sulfonated polystyrene having 5–25% of its cation-exchange capacity occupied by an organo mercapto amine covalently bonded to the cation-exchange backbone by nitrogen sulfur linkages.

2. A method in accordance with claim 1, where the bisphenol is bisphenol-A.

4,294,996
METHOD OF REDUCING FORMATION OF CHLORINATED DIOXINS IN MANUFACTURE OF CHLORINATED PHENOLS

William H. Wetzel, Federal Way; Hsi-Lung Pan, Seattle; Robert J. Goodwin, Puyalup, and John E. Wilkinson, Gig Harbor, all of Wash., assignors to Reichhold Chemicals, Incorporated, White Plains, N.Y.

Filed Jun. 9, 1980, Ser. No. 157,447
Int. Cl.³ C07C 39/36, 39/27
U.S. Cl. 568—776 15 Claims

1. A process for producing polychlorinated phenols having reduced amount of chlorinated dioxin formed therein during processing comprising reacting at a temperature of from 10° C. to 190° C. (A) a phenol, which is at least one member selected from a group consisting of phenol and lower chlorophenols and mixtures thereof, (B) chlorine to form a reaction mixture in the presence of from about 0.005 to about 0.016 moles per mole of (A) used of an acid catalyst, said catalyst consisting essentially of aluminum chloride, ferric chloride, aluminum tris-butoxide, antimony chloride, stanous chloride, cuprous chloride, metallic aluminum powder, metallic antimony, metallic copper or mixtures thereof; the improvement consisting of adding to the reaction mixture from about 0.0001 to 0.5 moles per mole of (A) used of a dioxin inhibitor selected from the group consisting of:

Antimony pentachloride
Chromium dichloride
Chromium powder
Chromium sulfide
Cobalt metal
Gadolinium trichloride
Germanium tetrachloride
Hafnium tetrachloride
Indium chloride
Magnesium turnings
Manganese dichloride
Niobium chloride
Zirconium tetrachloride
Antimony powder
Bismuth trichloride
Chromium metal
Cobalt fluoride
Iridium chloride
Niobium pentachloride
Rhenium pentachloride
Rhodium trichloride
Samarium trichloride
Tantalum chloride
Tin powder
Tungsten hexachloride
Zinc fluoride
Rubidium trichloride

and mixtures thereof.

4,294,997
PROCESS FOR THE CONTROL OF PH IN THE ETHYNYLATION OF FORMALDEHYDE

Albert M. Stock, LaPorte, and James D. Verbsky, Seabrook, both of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 10, 1978, Ser. No. 923,371
Int. Cl.³ C07C 33/046
U.S. Cl. 568—855 14 Claims

1. In the process for the production of butynediol by contacting acetylene and formaldehyde in the presence of a particulate copper acetylide catalyst in an agitated aqueous medium in a continuous reaction at 60°–120° C., the improvement wherein the pH of the reaction mixture is maintained at from 5–8 by the incremental or continuous addition of an aqueous solution of an alkali metal hydroxide and an alkali metal carbonate at equivalent ratios of alkali metal hydroxide to alkali metal carbonate of 1:1–4:1.

4,294,998

PREPARATION OF HIGH PURITY 1,4-BUTANEDIOL

Harry B. Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 920,123, Jun. 28, 1978. This application Jul. 31, 1980, Ser. No. 174,258
Int. Cl.[3] C07C *29/78*
U.S. Cl. 568—868 13 Claims

1. A process for purifying 1,4-butanediol, the process comprising

(a) crystallizing 1,4-butanediol from a crude liquid comprising

(1) 35–85%, by weight, of 1,4-butanediol and

(2) 2–15%, by weight, of impurities dissolved in tetrahydrofuran, by holding the liquid at a temperature of −10° C. to +10° C., to form a slurry of 1,4-butanediol crystals; and then

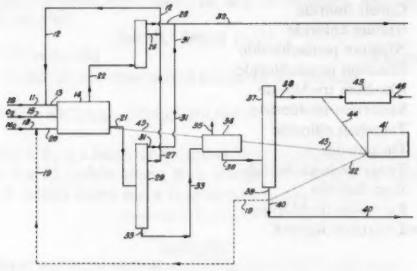
(b) separating the crystals from the crude liquid.

4,294,999

PREPARING OXYGEN-CONTAINING FUEL WHEREIN TERTIARY BUTYL ALCOHOL IS THE MAJOR PRODUCT OF THE PROCESS

Henry R. Grane, Springfield; John C. Jubin, Jr., Wallingford, and G. Richard Worrell, Media, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 45,454, Jun. 4, 1979, abandoned. This application Feb. 25, 1980, Ser. No. 124,035
Int. Cl.[3] C07C *29/50*
U.S. Cl. 568—910 2 Claims



1. The method of preparing a motor fuel blending component which consists of:

maintaining in an oxidation zone a liquid consisting of dissolved isobutane and oxidate, said oxidate comprising dissolved byproducts, tertiary butyl hydroperoxide, and tertiary butyl alcohol, solubilized molybdenum catalyst in a concentration corresponding to from about 1 to about 1,000 parts per million of isobutane, while injecting into the liquid a gas comprising oxygen and while injecting into the liquid a mixture of recycled and fresh isobutane;

maintaining the liquid in said oxidation zone at a temperature within the range from 240° F. to 310° F. at a pressure adapted to maintain much of the isobutane in the liquid phase, said pressure being within the range from 200 to 1000 psig;

controlling product withdrawal rate and isobutane injection rate to provide a residence time within the range from about 3 to about 10 hours;

transferring from said oxidation zone a liquid stream, and directing said liquid stream through a debutanizing zone, to provide a debutanized liquid stream, and to provide a stream of isobutane recycled from the liquid, and to provide a withdrawn vapor stream comprising nitrogen, oxygen, carbon monoxide, and carbon dioxide;

transferring from said oxidation zone a vapor stream comprising nitrogen, oxygen, carbon monoxide, carbon dioxide, and isobutane, said vapor stream being subjected to partial condensation to provide a stream of isobutane recycled from a vapor zone of the oxidation zone, and to provide a withdrawn vapor stream comprising nitrogen, oxygen, carbon monoxide and carbon dioxide;

directing said debutanized liquid stream to a thermal decomposition zone maintained at a temperature within the range from about 260° F. to about 320° F. for from about 2 to about 8 hours to decompose a significant portion of the tertiary butyl hydroperoxide to form tertiary butyl alcohol and oxygen, and withdrawing a stream of oxygen from said decomposition zone;

transferring liquid from said decomposition zone for transfer to a distillation zone in which there is a distillate stream comprising acetone, methanol, and tertiary butyl alcohol which is taken overhead, and in which there is a residual liquid stream containing measurable amounts of tertiary butyl hydroperoxide, sufficient tertiary butyl alcohol to provide a unit weight ratio of tertiary butyl alcohol to tertiary butyl hydroperoxide greater than one, byproducts which are not completely codistilled with tertiary butyl alcohol, and molybdenum catalyst;

withdrawing said residual liquid stream;

subjecting said distillate stream to treatment in a peroxide clean-up zone, said treatment consisting of heating the liquid at from 375° F. to 475° F. for a time of from 1 minute to 10 minutes to provide a motor fuel blending component; and

withdrawing from the peroxide clean-up zone a motor fuel blending component product stream containing tertiary butyl alcohol as the major product of the process, said stream also containing methanol.

4,295,000

ELECTRODE-POSITION CONTROL IN ARC FURNACES

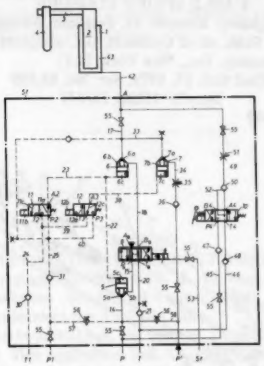
Edgar Mark, Lohr, Fed. Rep. of Germany, assignor to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Jan. 10, 1980, Ser. No. 110,855

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901198

Int. Cl.³ H05B 7/156

U.S. Cl. 13—13 5 Claims



1. An electrode position control for arc furnaces comprising a hydraulically operated cylinder and piston unit having a cylinder chamber and a plunger piston extending into said cylinder chamber and connected to an electrode to be moved; a three-position control valve; a first pressure conduit connecting said control valve with a source of pressure fluid; a working conduit connecting said control valve with said cylinder chamber, said control valve being movable from a neutral position to a first operating position connecting said working chamber with a reservoir so that pressure fluid will flow out from said cylinder chamber to lower said electrode and a second operating position connecting said working conduit with a pressure source so that pressure fluid will flow into said cylinder chamber to raise said electrode; a first preselectable two-way valve movable between a closed and an open position in said first pressure conduit; a second preselectable two-way valve movable between an open and a closed position in said working conduit; a second pressure conduit connecting said chamber directly with said pressure source; a third preselectable two-way valve movable between an open and a closed position in said pressure conduit, and means cooperating with said two-way valves for moving said first and second two-way valves to said closed position while moving said third two-way vlave to said open position and vice versa.

4,295,001

ELECTRODE SEAL

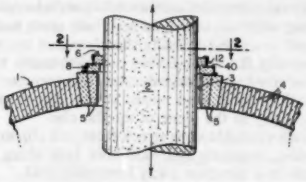
Kenneth L. Britton, Claypool, Ariz., assignor to Inspiration Consolidated Copper Company, Inspiration, Ariz.

Filed Dec. 3, 1979, Ser. No. 99,632

Int. Cl.³ H05B 7/12

U.S. Cl. 13—17 10 Claims

1. An electrode seal for an electric furnace having at least one electrode movable into and out of said furnace through an opening in the furnace roof wherein said seal comprises a first ring including a plurality of radially slidable first refractory bricks partially overlying said opening and adapted to contact and seal with the periphery of said electrode, and contractions means for periodically exerting a contraction force on said first ring to slide said first refractory bricks radially inwardly towards said electrode until said first refractory bricks contact and seal with the periphery of said electrode and wherein said first refractory bricks are free to slide radially outwardly of said opening under force of engagement with the periphery of



said electrode during periods of time when said contraction means does not exert a contraction force on said first ring.

4,295,002

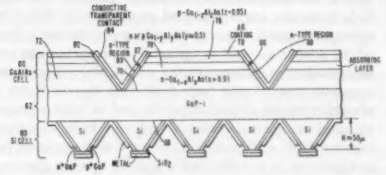
HETEROJUNCTION V-GROOVE MULTIJUNCTION SOLAR CELL

Terry I. Chappell, Amawalk, and Jerry M. Woodall, Bedford Hills, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 23, 1980, Ser. No. 161,820

Int. Cl.³ H01L 31/06

U.S. Cl. 136—244 17 Claims



1. A solar energy converter comprising:

a first solar cell comprising first multiple p-n heterojunctions in association with a first type of optically active semiconductor material on one side of an insulating substrate; and

a second solar cell comprising second multiple p-n heterojunctions in association with a second type of optically active semiconductor material on the opposite side of the insulating substrate;

said first type of semiconductor material is GaAlAs, said second type of semiconductor material is Si, and said insulating substrate is semi-insulating GaP.

4,295,003

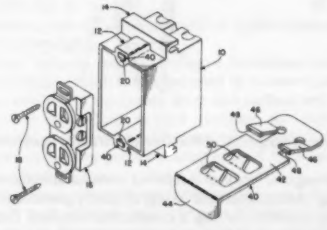
THREADED SCREW MOUNTING MEANS

Jesus Borja, Glenview, and Jack R. Halvorsen, Mt. Prospect, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 7, 1980, Ser. No. 110,055

Int. Cl.³ H02G 3/08

U.S. Cl. 174—53 14 Claims



1. A threaded screw mounting means including:

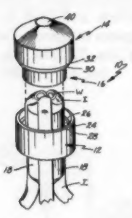
a screw mounting member;
a generally D-shaped bore hole open along its flat side formed in said mounting member;
an axially extending slot substantially parallel to and communicating with said D-shaped bore hole along said open flat side and extending laterally therefrom;
a substantially flat clip member complementary to and slidably received within said slot, said clip member including:
substantially planar head means at one end extending perpendicularly to the plane of the flat clip,
at least two yieldable arms struck from said clip member and extending angularly into said bore hole along said open flat side in a direction away from said head,
a pair of spaced yieldable leg members struck from adjacent the opposite edges of said clip and providing shoulder means in spaced opposition to said head, said leg members extending outwardly from the same side of the plane of said clip member as said at least two yieldable arms extend,
said slot and bore having a coterminous predetermined axial extent whereby when said clip member has been fully inserted said head bears against the outer one end of said mounting member and said leg members which flex during insertion into said slot snap outwardly after passage through said slot and bear against said mounting member adjacent said bore hole at its end opposite said outer end in locking engagement,
said at least two yieldable arms being deflectable when a screw threaded member is axially pushed into said bore hole from the outer end and engages said thread against retrograde axial movement while permitting adjustment of the screw, as well as removal, by appropriate rotation, said mounting member being counterbored adjacent said opposite end of said bore hole and slot to form abrupt shoulder means at said opposite end at least adjacent said slot and on opposite sides of said bore hole, said slot being tapered from said outer end toward said opposite end and terminating in parallel walls spaced apart a distance substantially equal to the effective thickness of said clip member for a limited axial distance adjacent the point where said slot communicates with said counterbore, said limited axial distance of said parallel walls gripping said clip member only in the region axially intermediate said yieldable arms and legs.

4,295,004

WIRE CONNECTOR

William C. Dauser, Jr., North Muskegon, Mich., assignor to Lloyd A., Trustee Heneveld, Grand Rapids, Mich.

Filed Dec. 3, 1979, Ser. No. 99,624
Int. Cl.³ H01R *11/00*
U.S. Cl. 174—87 **17 Claims**



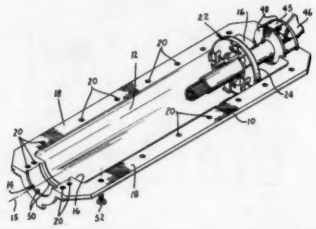
1. A self-stripping solderless electrical connector comprising:
an elongated body of insulating material having wire receiving channels formed along at least a portion of its length;
a cap member having a conductive member fixed thereto, said cap member and said conductive member being adapted for positioning over and movable along a portion of said elongated body and said channels, said conductive member adapted to engage a plurality of insulated wire conductors positioned in said channels, cut through the insulation thereof, and engage wire conductors to provide an electrical connection therebetween upon movement of said cap member and conductive member along said elongated body.

4,295,005

CABLE SPLICE CLOSURE

Edgar E. Daugherty; Kenneth W. Jackson; Wesley W. Jones, and Naif T. Subh, all of Gwinnett, Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 17, 1979, Ser. No. 85,850
Int. Cl.³ H02G *15/113*
U.S. Cl. 174—92 **7 Claims**



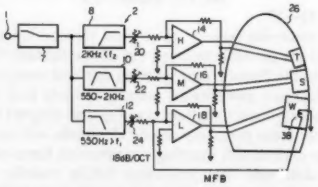
1. A telecommunications cable splice closure comprising a pair of elongated covers each having a generally semi-cylindrical interior wall extending radially about a closure axis from opposed ends of which wall two flat end walls extend approximately normally to said closure axis with each end wall defining an opening from which a closure end port extends; a pair of cable clamp supports having generally annular rims sized to be positioned about a cable within said cover interior walls in flush contact or in point contact with said end walls; and means for securing said pair of covers together about said pair of cable clamp supports; whereby during a splicing operation a cable clamp support may temporarily be positioned within the covers in point contact with a cover end wall clamped about a cable entering the closure through an end port at a skewed angle with respect to the closure axis and later be pulled into flush contact with the end wall as the cable is straightened into a position along the closure axis.

4,295,006

SPEAKER SYSTEM

Mitsuaki Tanaka, and Hidetsugu Suzuki, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 23, 1979, Ser. No. 32,229
Claims priority, application Japan, Apr. 24, 1978, 53-54248[U]; Jul. 6, 1978, 53-93181[U]
Int. Cl.³ H04R *1/28*
U.S. Cl. 179—1 E **19 Claims**



1. A speaker system comprising:

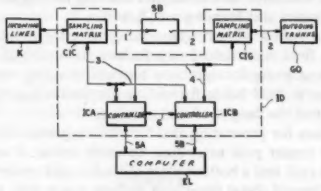
(a) a speaker enclosure having a diffraction characteristic;
(b) at least one speaker installed in said enclosure;
(c) a diffraction compensation circuit responsive to an input electrical audio signal for relatively elevating the level of the electrical signal at low frequencies so as to compensate for said diffraction characteristic of said speaker enclosure, said speaker being responsive to the output signal of said diffraction compensation circuit, said diffraction compensation circuit including a lowpass filter and an amplifier to exhibit a frequency characteristic opposite to said diffraction chacteristic.

4,295,007

LINE IDENTIFIER FOR SWITCHBOARDS

Luciano Astegiano, and Wouter M. D. van Veen, both of Turin, Italy, assignors to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 953,163, Oct. 20, 1978, Pat. No. 4,252,998. This application Feb. 11, 1980, Ser. No. 120,545
Claims priority, application Italy, Oct. 21, 1977, 69356 A/77
Int. Cl.³ H04M *5/04, 15/00*
U.S. Cl. 179—7 R **17 Claims**



1. In a telecommunications system including a switchboard with multiplicity of incoming lines and a multiplicity of outgoing lines,

the combination therewith of a line identifier for monitoring switchboard activity and for establishing a communication link between a selected incoming line and a selected outgoing line in response to manual operations at said switchboard, said line identifier comprising:

first detector means connected to said switchboard for generating a signal coding the identity of a selected incoming line and for requesting the identification of a concomitantly selected outgoing line;

second detector means connected to said switchboard for generating a signal coding the identity of a selected outgoing line;

switching means coupled to said lines for connecting a selected incoming line to a concomitantly selected outgoing line upon the successful recognition thereof by said line identifier; and

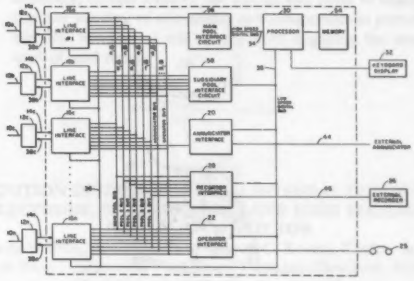
control means operationally linked to said first detector means for decoding identification-request signals therefrom, to said second detector means for enabling same to emit a trunk-identifying signal upon the reception by said control means of a request signal from said first detector means, and to said switching means for activating same to connect a selected incoming line to a concomitantly selected outgoing line upon the decoding by said control means of a signal from said second detector means indicating such outgoing line.

4,295,008

TELEPHONE-CONFERENCING APPARATUS AND METHOD HAVING RESPONSE TALLYING

Avery R. Johnson, Milford, N.H.; Richard G. McGurk, Hull, Mass., and John M. Harrison, Epsom, N.H., assignors to Small World Exchange, Inc., Nashua, N.H.

Filed Mar. 23, 1979, Ser. No. 23,387
Int. Cl.³ H04M *3/22, 3/56*
U.S. Cl. 179—18 BC **8 Claims**



1. Telephone conferencing apparatus comprising

input means for concurrently receiving a plurality of incoming calls over an associated plurality of incoming telephone lines and responding to a caller-initiated signaling condition on any incoming line for conditioning that line for conference communication,

control means responsive to said input means for connecting said lines associated with said incoming calls to at least one conference grouping wherein any associated incoming line in the grouping provides communication with other lines in said grouping and wherein said grouping has the capacity of at least three incoming calls, said control means providing said connecting of each line, to such a conference grouping, independently of the connecting of other of said lines to a conference grouping,

monitor means operatively responsive to the incoming signal energy on each incoming line for generating electrical report signals distinct from incoming communication and indicating at least which of said lines carries incoming communication,

means for initiating a tally condition, and

tally means responsive to said monitor means and to said tally condition-initiating means for providing a summation of the number of lines having associated therewith reports signals during a selected time interval.

4,295,009

PIEZOELECTRIC AUDIO TRANSDUCER MOUNTING AND ELECTRICAL CONNECTOR

Charles H. Weidler, Lancaster, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 7, 1980, Ser. No. 128,331
Int. Cl.³ H04R *17/00*
U.S. Cl. 179—110 A **10 Claims**

1. Supporting and contacting means for a piezoelectric audio transducer comprising:

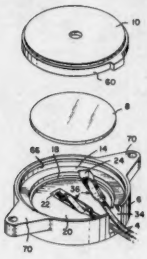
transducer housing means having a transducer-receiving recess therein which is dimensioned to receive said transducer, said recess having an inner end surface and having transducer-supporting surface portions for supporting peripheral portions of said transducer, said transducer supporting surface portions being spaced from said inner end surface,

first and second terminal-receiving wells in said inner end surface, each of said wells having a terminal-supporting floor and having sidewalls extending from said inner end surface to said terminal-supporting floor,

first and second contact terminal in said wells, each of said

terminals having an elongated generally channel-shaped frame section comprising a web and terminal sidewalls extending from said web, said web being on said floor and said terminal sidewalls being against said well sidewalls,

an elongated spring struck from said web along the length thereof, said spring extending obliquely from said web at an acute angle and having a contact portion which is normally elevated above said inner end surface and above said transducer supporting surface portions,



conductor means extending from said web at each end thereof and externally of said housing means and

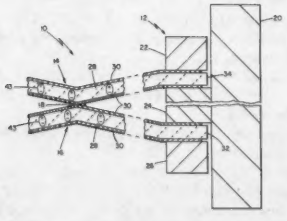
clamping means for clamping said transducer in said recess with peripheral portions thereof on said transducer supporting surfaces whereby, upon placement of said transducer in said recess, and clamping said transducer against said transducer supporting surface portions, said contact springs are flexed towards said webs of said terminals and are thereby placed in preloaded resilient contact with said transducer.

4,295,010

PLURAL PIEZOELECTRIC POLYMER FILM ACOUSTIC TRANSDUCER

Preston V. Murphy, Geneva, Switzerland, assignor to Lectret S.A., Geneva, Switzerland

Filed Feb. 22, 1980, Ser. No. 123,719
Int. Cl.³ H04R *17/00*
U.S. Cl. 179—110 A **15 Claims**



1. An acoustic transducer comprising:

a hollow support member, and

a plurality of metal-coated piezoelectric polymer films to act as an oscillator, said films being

spaced apart at their peripheries,

mounted at said peripheries to said support member, and

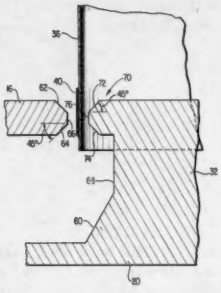
physically connected to at least one adjacent film near their centers.

4,295,011

LINEAR EXCURSION-CONSTANT INDUCTANCE LOUDSPEAKER

Dana B. Hathaway, Amesbury, Mass., assignor to Epicure Products Inc., Newburyport, Mass.

Filed Sep. 11, 1979, Ser. No. 74,507
Int. Cl.³ H04R *9/06*
U.S. Cl. 179—115.5 VC **19 Claims**



1. A loudspeaker, comprising:

a frame,

a speaker cone attached at its widest portion to the frame,

a hollow cylindrical voice coil attached to the narrow portion of the cone and having a winding formed on the end of the voice coil distal said cone, said winding having no more than two layers and forming a coil, and

means attached to said frame for generating a focused magnetic field, said field being formed to surround said voice coil and being focused onto said coil winding, said focused magnetic field being formed as a cylinder having a height less than the height of said winding;

said means for generating said focused magnetic field comprising a center pole extending upwards inside of said hollow voice coil, and a bottom plate affixed to said center pole at an end thereof distal from said hollow voice coil, said center pole having a midsection and a portion of gradually increasing diameter, said diameter gradually increasing from said midsection through said portion of gradually increasing diameter to said end of said center pole distal said hollow voice coil, whereby to add increased magnetizable mass to said center pole.

4,295,012

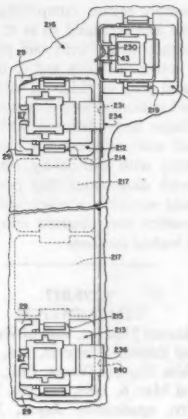
SECRETARIAL SHIFT MECHANISM FOR AN ELECTRIC KEYBOARD

Robert J. Keeler, Elmhurst, and Stanley E. Filipiak, Chicago, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 4, 1980, Ser. No. 118,038
Int. Cl.³ H01H *9/20*
U.S. Cl. 200—5 B **8 Claims**

1. A keyboard mechanism comprising a shift keyswitch and a shift lock keyswitch positioned adjacent said shift keyswitch wherein each of said keyswitches comprises a switching means, a housing with a base for said switching means, an actuating member in the form of a plunger within said housing mounted for movement relative to said housing base from an initial undepressed position to a depressed position for actuating said switching means when said actuating member is in said depressed position, resilient means for returning said actuating member to its undepressed position and wherein said mechanism further comprises a ledge formed on said actuating member of said shift lock keyswitch, locking means which is resiliently biased toward said ledge and which engages said ledge so as to hold said actuating member of said shift lock keyswitch in its depressed position when said actuating member of said

shift keyswitch is in its undepressed position, but which does not engage said ledge when said actuating member of said shift lock keyswitch is in its undepressed position and said actuating member of said shift keyswitch is depressed, rotatable release means connected to said locking means and an actuator bar operable exteriorly of said housing and including an arm connected to said actuating member of said shift keyswitch which is constructed to engage said rotatable release means when said



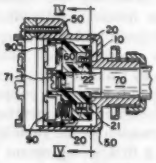
actuating member of said shift keyswitch is depressed and said actuating member of said shift lock keyswitch is held in its depressed position in a manner which causes said rotatable release means to rotate sufficiently far to allow said locking means to be withdrawn clear of said ledge which in turn allows said actuating member of said shift lock keyswitch to be returned to its initial undepressed position by said resilient means of said shift lock keyswitch.

4,295,013

IGNITION SWITCH

Millard E. Gage, Otego, and Derek J. Landers, Sidney Center, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 12, 1980, Ser. No. 149,108
Int. Cl.³ H01H *21/62*
U.S. Cl. 200—11 C **2 Claims**



1. In combination with a switch of the type having: a housing which includes an internal shoulder; a rotor which includes a central passage and an annular recess located at one end and spaced from said central passage, said recess including a inner wall and an outer wall; means for mounting said rotor for radial movement within said housing, said means including a shaft disposed in said rotor central passage and connected to said rotor; at least one electrical contact mounted on the other opposite end of said rotor; a coil spring mounted in the annular recess of said rotor; means for attaching one end of said spring to said rotor; and a plate connected to the other opposite end of said spring, said plate having an extended portion adapted to engage said housing shoulder when said rotor is rotated a predetermined distance, the improvement wherein:

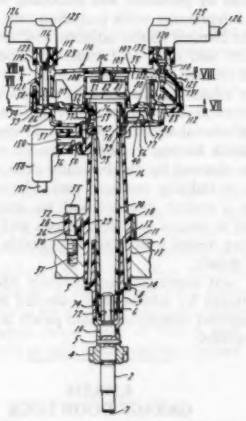
the retainer plate includes a tab projecting from the surface of said plate in the direction of said spring and located adjacent the inner diameter of the first winding of said spring, whereby when said rotor is rotated a predetermined distance the extended portion of said plate engages said housing shoulder and further rotation of said rotor causes said rotor to wind said spring which compresses inwardly, further causing the tab on said plate to engage the first winding of said spring as it compresses to prevent the first winding of said spring from engaging the inner wall of said recess.

4,295,014

IGNITION DISTRIBUTOR WITH INTEGRAL COMMON ELECTRODE, SHAFT BEARING AND HIGH VOLTAGE TERMINAL CONNECTOR

David H. Fox, Ann Arbor, and Charles C. Kostan, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1979, Ser. No. 103,675
Int. Cl.³ H01H *19/00*
U.S. Cl. 200—19 R **4 Claims**



1. A high voltage commutation distributor for an internal combustion engine comprising:

a distributor base for mounting on said engine, defining a shaft housing and a portion of an electrical commutation cavity;

a distributor cap for mounting on said base and defining the remaining portion of said commutation cavity;

means defining a plurality of spark plug terminal connectors mounted within said commutation cavity;

a rotor driveshaft formed of electrically insulative material mounted within said shaft housing and being rotationally driven by said engine;

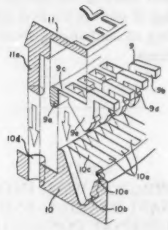
unitary structure means mounted on said base within said cavity and formed entirely of an electrically conductive material for providing both a common high voltage conductor means and means for mounting said driveshaft in said base for rotation about a central axis therein; and

means defining a rotor element mounted on said rotor driveshaft for providing electrical commutation between said common high voltage conductor means and respective ones of of said spark plug terminal connectors.

4,295,015
REPEAT TYPE TIME SWITCH

Ichiroh Fujiwara; Yoshiaki Motoki; Toshinori Inoue, and Kazuma Fukuoka, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1979, Ser. No. 73,133
Claims priority, application Japan, Sep. 14, 1978, 53-112930
Int. Cl.[3] H01H 7/00
U.S. Cl. 200—38 R 3 Claims



1. A time switch comprising:

a cradle substantially in the form of a disk and rotatable about an axis;

a plurality of circumferentially spaced axial depressions on one axial surface of said cradle, said depressions being separated by partitions and including radially outwardly located depression walls including two detent means;

an annular element fixable adjacent said surface and concentric with said disk, said annular element being radially inward relative to said depressions;

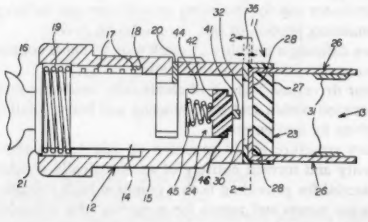
a radially extending change over pawl for each of said depressions and each said pawl having substantially the same circumferential width as one of said depressions, each of said pawls having a radially inward end fixed to said annular element by an elastically deformable connecting means, a radially outward end adapted to selectively engage a switch element and an intermediate portion inserted in one of said depressions and having a surface including means selectively engageable with one of said detent means;

whereby said depression substantially encloses all of said pawl except for said radially outward end and said partitions prevent distortion of said pawls in the circumferential direction.

4,295,016
GARAGE DOOR LOCK

John H. Cantlin, Lincoln, Mass., assignor to Hudson Lock, Inc., Hudson, Mass.

Filed Dec. 14, 1979, Ser. No. 103,532
Int. Cl.[3] H01H 27/06
U.S. Cl. 200—44 9 Claims



1. A lockable electrical switch comprising:

a lock shell;

a cylindrical plug mounted within said shell for rotary movement between locked and unlocked positions and for axial movement between active and inactive positions, said plug defining a keyway and a plurality of tumblerways intersecting therewith;

tumbler means movably mounted in said tumblerways, said tumbler means operatively engaging said shell and said plug so as to prevent relative rotation therebetween in the absence of a proper key in said keyway;

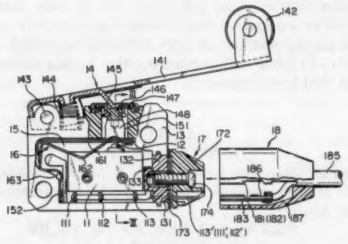
a movable contact means mounted for movement with said plug; and

stationary assembly means comprising stationary contact means shaped and arranged so as to be engaged by said movable contact means with said plug in both said unlocked and active positions and to be disengaged therefrom with said plug in either of said locked or inactive positions, said stationary assembly means further comprising an insulator body defining both an internal cavity retaining said stationary contact means and an opening communicating with said cavity, said opening having a periphery with dimensions that permit entry into said cavity of said movable contact with said plug in said unlocked position and obstruct entry thereof with said plug in said locked position.

4,295,017
LIMIT SWITCH

Isoo Kashima; Masami Mishina, both of Watarai; Yosio Takase, Matsuzaka, and Katsumi Maruchi, Tsu, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 6, 1980, Ser. No. 127,885
Claims priority, application Japan, Mar. 6, 1979, 54-285131[U]
Int. Cl.[3] H01H 3/16
U.S. Cl. 200—47 20 Claims



1. In a limit switch comprising a switching means having a push-button for actuating said means, a housing having an interior space for housing said switching means, means provided to communicate said interior space with the exterior of said housing for operating said push-button to actuate the switching means by transmitting an externally given operating force to the push-button, means cooperating with said operating means for absorbing said operating force applied sequentially after an actuation of the switching means, the combination comprising a first spring means fixed at one end within said interior space of the housing and extended at the other end to be engageable with the push-button, said the other end of said first spring means providing a first biasing force acting substantially in the same direction as said operating force, and a second spring means fixed at one end within said interior space of the housing and extended at the other end to a position adjacent said the other end of said first spring means to provide thereto a second biasing force in a direction opposite to the operating force for normally restraining the other end of the first spring means from engaging the push-button against said first biasing force, said second spring means engaging said operating means to act as said absorbing means and releasing said restraint to the other end of the first spring means in response to the operating force applied through the operating

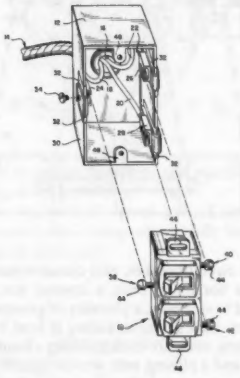
means to allow the first spring means to engage and operate the push-button with the first biasing force.

4,295,018

ELECTRICAL HOUSING AND SWITCH BOX

Dominick Borrelli, 2243 Cropsey Ave., Brooklyn, N.Y. 11214

Filed Apr. 28, 1980, Ser. No. 144,386
Int. Cl.³ H01R *33/30*
U.S. Cl. 200—51.09 **5 Claims**



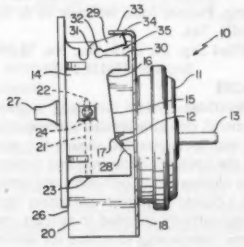
1. An electrical switch assembly comprising a housing having first and second openings therein, and adapted to receive a plurality of electrical wires internally thereof through said first opening, a plurality of electrically conductive contacts mounted on said housing adjacent said second opening, said contacts having means for receiving the said wires, each contact receiving a different one of said wires; a switch box for electrically connecting and disconnecting said wires, said switch box having a plurality of electrical connector means thereon, each of said contacts having a connector receiving opening therein for receiving and partially enclosing one of said connector means when the switch box is pushed into said housing, each connector being shaped to engage said opening.

4,295,019

WATER LEVEL CONTROL DEVICE AND METHOD OF MAKING THE SAME

Thomas M. Buckshaw, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Oct. 24, 1979, Ser. No. 87,753
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—61.2 **12 Claims**



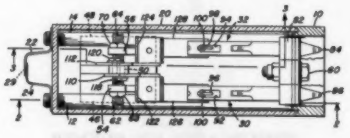
1. In a water level control device having a cam follower for setting the desired water level setting for said control device and a movable cam means having a cam surface engaging said cam follower to set the same in desired positions, said cam surface having a reset portion for resetting said control device when said reset portion is disposed against said cam follower, said control device having a spring means that cooperates with said cam means to tend to move said cam means from its resetting position when said reset portion is disposed against said cam follower, the improvement wherein said spring means is integral and homogeneous with said cam means whereby said cam means and said spring means comprises a one-piece homogeneous structure.

4,295,020

ELECTRICAL SWITCH MECHANISM

James Heydweiller, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,568
Int. Cl.³ H01H *35/14*
U.S. Cl. 200—61.45 R **11 Claims**



1. A switch mechanism which comprises at least a first set of switch contacts which are moveable with respect to each other between make and break positions where said contacts are in contact and apart respectively, an axle, a pendulum pivotally moveable about said axle with respect to the vertical in first and second opposite directions in response to deceleration and acceleration events in said opposite directions, an arm mounted on said pendulum for actuating said contacts when said pendulum moves a predetermined distance in one of said opposite directions in response to the occurrence of a predetermined level of one of said acceleration and deceleration events which is applied to said mechanism, means pivotally supporting said arm on said pendulum and for adjusting the position of said arm on said pendulum to selected different inclinations with respect to the vertical for selecting said predetermined level of said one event upon occurrence of which said first set of contacts is actuated to said other position thereof.

4,295,021

ELECTROMAGNETIC ARC EXTINCTION APPARATUS FOR SWITCHGEAR

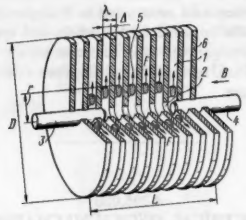
Erik I. Asinovsky, 16 Parkovaya ulitsa, 49, korpus 1, kv. 78; Anatoly A. Afanasiev, Ljubertsy, ulitsa Shosseinaya, 10, kv. 137; Evgeny P. Pakhomov, Yakhromskaya ulitsa, 3, korpus 2, kv. 30; Vladimir A. Zeigarnik, Bolshoi Tishinsky pereulok, 41, kv. 9, all of Moscow, and Ivan M. Yartsev, ulitsa Teatralnaya, 27, korpus 3, kv. 28, Dolgoprudny, Moskovskaya oblast, all of U.S.S.R.

Filed Jan. 19, 1979, Ser. No. 4,669
Int. Cl.³ H01H *33/06*
U.S. Cl. 200—147 R **9 Claims**

1. An electromagnetic arc extinction apparatus for switchgear, comprising:

an arc chamber defined by an electrically insulating material and having a cavity extending along a helix so as to allow a quenching arc in the form of a helix to be moved in a radial direction, said cavity having a pitch which is at least 10 times smaller than the diameter of the arc chamber measured over the cross-section thereof;

an axial channel extending axially through said arc chamber; and



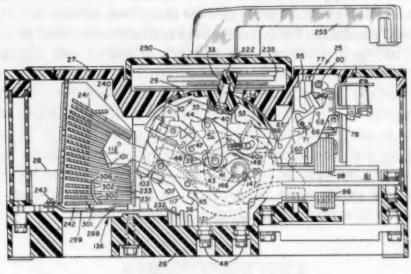
two electrodes at least in part situated in said axial channel and arranged in alignment with the axis of said arc chamber and adapted to form said quenching arc.

4,295,022

TRIFURCATED ARC RUNNER

Charles T. Robins, Swarthmore, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 15, 1979, Ser. No. 20,767
Int. Cl.³ H01H *33/20*
U.S. Cl. 200—147 R **10 Claims**



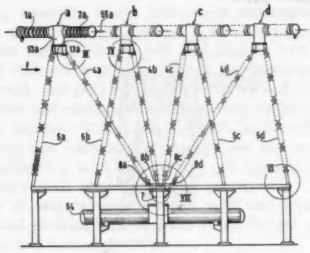
1. A circuit breaker including an elongated conducting strap having first and second ends; stationary contact means mounted on said strap and positioned in front of a first face thereof at said first end; said stationary contact means including a stationary arcing contact section and a stationary main contact section positioned closer to said first end than said stationary arcing contact section; movable contact means including movable arcing and main contact sections operable into and out of engagement with the respective stationary arcing and main contact sections; arc chute means to receive and extinguish electric current arcs drawn between said movable and stationary contact means upon separation thereof; said arc chute means being positioned in front of said first face and interposed between said stationary contact means and said second end; arc runner means in front of said first face and in electrical contact with said stationary arcing contact section and extending therefrom toward said second end; said arc runner means including at its end remote from said stationary main contact section a plurality of transversely spaced sections for dispersing various arc sections into different regions of said arc chute means.

4,295,023

GAS-BLAST CIRCUIT-BREAKER

Edmond Thuries, Pusignan; Pierre Vernat, and Roger Sauvat, both of Villeurbanne, France, assignors to Delle-Alsthom, Villeurbanne, France

Filed Jun. 13, 1979, Ser. No. 48,120
Int. Cl.³ H01H *33/14, 33/82*
U.S. Cl. 200—148 R **5 Claims**



1. A gas-blast circuit-breaker, said circuit-breaker including for each pole, a horizontal base, a control box, an actuator chamber secured to said base, a plurality of groups of arc-extinguising chambers, each group including at least two arc-extinguishing chambers, each arc-extinguishing chamber including an opening unit and a closing unit, arc-extinguishing chambers being electrically connected in series, each group including a support assembly, said support assembly comprising a plate, said control chamber fixed to said plate, said arc-extinguishing chambers being fixed to said control chamber and opening thereto, two insulating pillars extending between said plate and said base and being secured to said base, said column being fixed at one end to said plate and communicating through said plate with the interior of said arc-extinguishing chamber via said control box, said column being abutting at its other end to said actuator chamber and being secured thereto and communicating with the inside of said actuator chamber, said hollow column including rod means extending longitudinally interiorly thereof and controlling said opening and closing units, a compressed gas source connected to said actuator chamber for supplying compressed air via said actuator chamber and said hollow insulated column to said arc-extinguishing chambers and said actuator chamber including means for imparting simultaneous axial movement of said rod means so as to simultaneously open and close all of said opening and closing units of said plurality of groups of arc-extinguishing chambers.

4,295,024

SPRING BIASED ENERGY ABSORBER FOR VACUUM SWITCH CONTACT SHAFTS

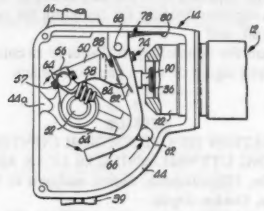
Eugene L. Kamp, Fulton, Mo., assignor to A. B. Chance Company, Centralia, Mo.

Filed Sep. 24, 1979, Ser. No. 78,094
Int. Cl.³ H01H *3/60*
U.S. Cl. 200—288 **4 Claims**

1. In an electrical switch including a pair of electrical contacts, soft metal, deformable shafts respectively supporting said contacts, and spring-loaded means for selective opening and closing of the contacts as desired and for creating a predetermined static closing force between said contacts when the contacts are in a closed condition, including opening and closing apparatus operatively coupled to at least one of the shafts, the improvement comprising structure for slowing the relative closing speed of said contacts prior to the instant of impact between said contacts for absorbing a part of the impact force developed during closing of said contacts, and without substantially lessening said static closing force between the contacts when the contacts are closed, said structure including an elongated arm presenting an engagement surface;

means supporting said arm for pivoting movement thereof and in a location proximal to said closing apparatus; and

means associated with said arm for biasing the arm to a disposition where said surface is in the path of said closing apparatus during closing of said contacts for causing said



apparatus to engage and pivot said arm immediately prior to closing of said contacts,

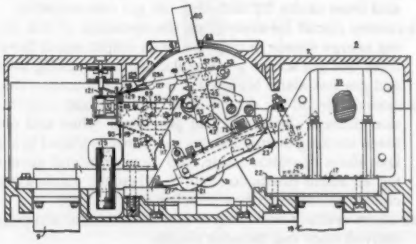
the distance between the pivot axis of said arm and said engagement surface being substantially less than the overall length of said arm.

4,295,025

CIRCUIT BREAKER WITH ELECTROMECHANICAL TRIP MEANS

William E. Beatty, Jr., Beaver Falls, and James P. Ellsworth, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 6, 1980, Ser. No. 156,961
Int. Cl.³ H01N *3/60*; N01N *9/20*
U.S. Cl. 200—288 **1 Claim**



1. A circuit interrupter, comprising:

(a) housing means;

(b) contact means disposed within said housing means for being actuated to an opened state;

(c) manual actuating means disposed in said housing means to be moved to actuate said contact means;

(d) electromechanical trip means disposed in said housing means to be electromechanically moved to actuate said contact means and to provide an associated trip indication; and

(e) shock absorbing means generally comprised of a leaf spring connected to said electromechanical trip means so it is disposed to absorb the shock and vibration when said manual actuating means is manually operable to open and close said contacts.

4,295,026

SWITCH ADAPTER MECHANISM

Allen C. Williams, and Barbara J. Williams, both of 322 W. Jefferson Ct., Vernon Hills, Ill. 60061

Filed Nov. 5, 1979, Ser. No. 91,378
Int. Cl.³ H01H *3/04*
U.S. Cl. 200—331 **5 Claims**

1. Apparatus for use with a wall mounted switch of the type having an outlet box including at least one fastening aperture adapted for receiving a cover plate mounting screw and a vertically moveable operating level for turning the switch on and off, said apparatus comprising:

an elongate cover plate having an upper portion disposed overlying said outlet box and a lower portion depending therefrom, said upper portion including at least one mounting aperture adapted for receiving said mounting screw for stationarily securing said cover plate to said outlet box and an opening receiving said operating level for allowing local manual operation of said switch, said lower portion including a plurality of vertically spaced longitudinal slots;

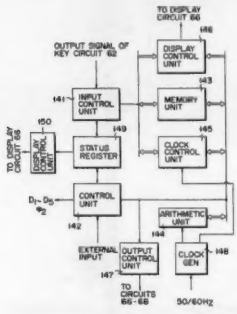
an elongate slide plate interposed between the wall and said cover plate, said slide plate including at least one longitudinal guide slot receiving said mounting screw for allowing limited vertical displacement of said slide plate relative to said cover plate, an opening receiving said lever for operating said switch in response to vertical movement of said slide plate, and a plurality of apertures each displaceable in a locus underlying a respective one of said cover plate longitudinal slots in response to vertical movement of said slide plate; and

a single horizontally disposed operating member passing through a selected one of said cover plate longitudinal slots and snugly engaging the associated one of said slide plate apertures, said slide plate being moveable for operating said switch in response to vertical displacement of said operating member from an adjustable height above the floor corresponding to said selected cover plate longitudinal slot while said cover plate is maintained in a stationary orientation.

4,295,027
MICROWAVE OVENS WITH PROGRAMMABLE CONTROL

Sadao Zushi, Fuji, and Yoshio Oida, Funabashi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 887,221, Mar. 16, 1978, abandoned. This application Jan. 17, 1980, Ser. No. 113,050
Claims priority, application Japan, Mar. 18, 1977, 52-30106; Mar. 18, 1977, 52-30107; Mar. 18, 1977, 52-30108
Int. Cl.[3] H05B *9/06*
U.S. Cl. 219—10.55 B **15 Claims**

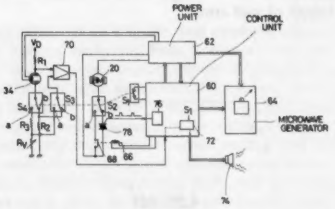


1. A microwave oven comprising:
a casing;
a heating chamber provided in the casing;
a door provided at an opening of the heating chamber;
a magnetron for supplying a microwave energy to the heating chamber;
a source circuit for energizing the magnetron;
key means provided at the front panel of the casing and including numeral keys, function keys including a time key for setting or changing at least a selected cooking time, a temperature key for setting or changing selected temperature in a cooking operation, a power level key for setting or changing power levels which control cooking speed, a "heat & hold" key for setting a temperature level to be held for a selected time period, a memory key for selecting more than one stage of cooking operations prior to starting the oven so that cooking automatically progresses from one stage to the next, a start key for starting a selected cooking operation and a clear key for stopping oven operation and clearing a prior selected cooking operation;
digital control logic means for encoding an operation condition determined in response to the operation of the function keys and numeral keys in said key means selectively operated by users, which comprise a key circuit and an input control unit including a key encoder for encoding an output signal of said key circuit and a key ROM supplied with the output of said key encoder;
memory means having at least three memory areas for memorizing the encoded operation condition regarding the time, temperature and power level encoded by the digital control logic means, respectively;
display means for displaying digitally the operation condition encoded by said digital control logic means;
operation means for initiating an operation in response to the operation of said start key to energize said magnetron based on the operation condition memorized in said memory means, which includes an oscillator, a timing signal generator supplied with the output of said oscillator, and a main ROM connected to memorize a predetermined program, a status register connected to said key ROM and said main ROM, a first display control unit connected to receive the output of said status register, a second display control unit connected to said memory means, a display circuit for supplying the outputs of said first and second display control units to said display means;
said second display control circuit comprising a control gate with controls interchange of data between said key ROM and said main ROM, a display register and a half adder which are supplied with the output of said control gate, a latch circuit supplied with the output of said display register, and a segment decoder for decoding the output of said latch circuit; and
control means for controlling said source circuit in response to an output signal of said operation means.

4,295,028
COMBINATION OF GAS SENSOR CONTROLLED COOKING UTENSIL AND GAS LEAK ALARM

Takeshi Tanabe, Higashiosaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1980, Ser. No. 123,278
Claims priority, application Japan, Feb. 23, 1979, 54-21061
Int. Cl.[3] H05B *6/68*
U.S. Cl. 219—10.55 B **4 Claims**



1. A combined cooking utensil and gas leak alarm comprising:
an oven cavity;
a cooking energy source for conducting the cooking operation of a foodstuff disposed in said oven cavity;
a blower fan system for introducing a fresh air into the oven cavity and exhausting gas from said oven cavity;
a gas sensor disposed in a path of the gas developed from said oven cavity for detecting the gas concentration;
a control circuit for controlling the operation of said cooking energy source in response to an output signal derived from said gas sensor when said combined cooking utensil and gas leak alarm is placed in a cooking operation mode;
a monitor circuit for detecting an ambience gas concentration through the use of said gas sensor when said combined cooking utensil and gas leak alarm is placed in a gas leak alarm operation mode, said monitor circuit developing an alarm instruction output when the ambience gas concentration exceeds a preselected value; and
an alarm system responding to said alarm instruction output derived from said monitor circuit.

4,295,029
BATTERY STRAP CONNECTION WELDING METHOD

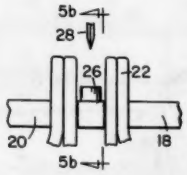
Toshio Uba, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 43,203, May 29, 1979, Pat. No. 4,241,151. This application May 27, 1980, Ser. No. 153,346
Int. Cl.[3] B23K *9/225, 9/16*
U.S. Cl. 219—75 **4 Claims**

1. A method for forming a unitary welded connection between collector tabs of electrode plates and a strap having at least one projecting leg, in a lead electrochemical cell, normally subject to variations in collector tab height relative to tne leg contributing to the problem of forming an unsatisfactorily high percentage of "bridge welds", comprising the steps of:

positioning the leg between a plurality of adjacent collector tabs having a thin cross section relative to the leg, and the tabs extending upwardly above the leg and a boss being provided on the upper surface of the leg, whereby the boss is sandwiched in close proximity to the adjacent upwardly extending collector tabs;

juxtaposing mold means having a high thermal conductivity against the sides of the collector tabs; and



supplying an electrode arc employing an inert-gas-shielded, non-consumable electrode to the weldable surface (comprising collector tabs, leg and included boss) to cause upwardly extending portions of the collector tabs, and at least a portion of the boss, to melt and flow together into a fused mass without the use of lead filler rods, the flow being contained by the mold means.

4,295,030

PLASMA-ARC CUTTING METHOD

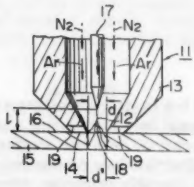
Naoyoshi Hosoda, 2-20-18, Denenchofu, Ota-ku, Tokyo, and Takeshi Hosoda, 2-22-7, Wakabayashi, Setagaya-ku, Tokyo, both of Japan

Continuation of Ser. No. 884,682, Mar. 8, 1978, abandoned. This application Sep. 19, 1979, Ser. No. 76,821

Claims priority, application Japan, Mar. 8, 1978, 53-34732

Int. Cl.³ B23K *9/16*

U.S. Cl. 219—121 PH **3 Claims**



1. A plasma-arc cutting method comprising:

contacting the end of an electrically conductive nozzle having a downwardly tapering lower end portion having a reduced inside nozzle diameter, with a base metal;

after said contacting, bringing a central electrode surrounded in spaced concentric relation by said nozzle towards the surface of said base metal in a flow of a first inert gas resulting in striking an arc on a first anode point on said base metal while said electrode is away from said base metal;

adding a second inert gas to the flow of said first inert gas;

changing the distance between the electrode and said base metal from a first distance employed while striking an arc between said electrode and said base metal to a second distance employed while cutting said base metal with said arc, said first distance being less than said second distance;

whereby said nozzle and said base metal are at the same electric potential while said base metal is being cut and an opening approximately equal in diameter to said reduced inside nozzle diameter is cut through said base metal.

4,295,031

ARC WELDING APPARATUS WITH OSCILLATING ELECTRODE

Richard A. Roen, Edmonton, Canada, assignor to The Research Council of Alberta, Edmonton, Canada

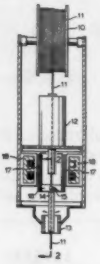
Continuation of Ser. No. 895,266, Apr. 10, 1978, Pat. No. 4,177,373. This application Jul. 10, 1979, Ser. No. 56,294

Claims priority, application United Kingdom, Aug. 3, 1977, 32626/77

The portion of the term of this patent subsequent to Dec. 4, 1996, has been disclaimed.

Int. Cl.³ B23K *9/12*

U.S. Cl. 219—125.12 **4 Claims**



1. Arc welding apparatus for use with a consumable electrode to form a weld between metal surfaces separated by a gap comprising, in combination, a welding torch, means for moving a consumable electrode through said torch and into said gap, means for moving the tip of said electrode along a predetermined path longitudinally of said gap, means for oscillating said electrode back and forth across said predetermined path, and means for applying an impact force to said electrode at the end of each half cycle of oscillation of said electrode to interrupt its movement and impel molten metal onto the one of the surfaces towards which said electrode was moving before impact, said welding torch including pivotably mounted electrode guide means for said electrode, said electrode passing through and contacting said guide means, said means for oscillating said electrode back and forth across said predetermined path including means for moving said electrode guide means, said means for moving said electrode guide means including electromagnetic means and armature means operably associated therewith and adapted to be magnetically attracted to said electromagnetic means when said electromagnetic means are energized, one of said electromagnetic means and said armature means being operably associated with said guide means, and means for energizing said electromagnetic means.

4,295,032

PROCESS FOR BALANCING A CRANKSHAFT

Takeshi Sasaki, Tokorozawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1979, Ser. No. 100,876

Claims priority, application Japan, Dec. 11, 1978, 53/151933

Int. Cl.³ B23K *9/04*; G01M *1/16*

U.S. Cl. 219—137 R **1 Claim**

1. In a process for balancing a crankshaft having pin portions and associated balancing weight parts counterbalancing said pin portions, and which includes the step of welding masses of welding wire to the balancing weight parts to compensate for imbalance of the crankshaft, the improvement comprising the steps of:

electronically sensing and obtaining an analog signal of the extent of imbalance in said crankshaft,

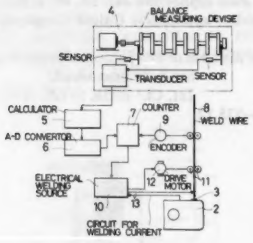
converting said analog signal to digital form,

feeding said digital signal to an electronic counter to count-up said counter,

employing said counter when other than in null condition to

activate a welding current supply and to activate a feed for welding wire,

obtaining a digital signal representative of the length and thus of the weight of the welding wire fed by said feed, and



supplying said signal representative of the length of the welding wire to said counter to progressively count-down said counter to a null condition and to deactivate said welding current supply and said feed.

4,295,033

ANNEALING OVEN

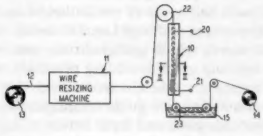
Hakan O. Lindgren, and Bengt Magnusson, both of Hallstahammar, Sweden, assignors to Bulten-Kanthal Aktiebolag, Hallstahammar, Sweden

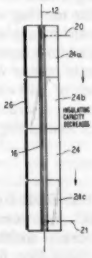
Filed Jul. 12, 1978, Ser. No. 923,968

Claims priority, application Sweden, Jun. 20, 1977, 7707127

Int. Cl.[3] H05B *3/40*

U.S. Cl. 219—388 **4 Claims**





1. An annealing oven for wire and the like, comprising:

(a) a tubular elongated heater, open at both of its ends, there being a wire-receptive passage extending between said ends, said heater being made of an electrical resistance alloy, said alloy being essentially molybdenumdisilicide;

(b) a pair of electrical terminals connected to said heater at longitudinally spaced points;

(c) guide structure at each end of said heater and disposed to keep moving wire in said passage out of contact with said heater; and

(d) at least one pair of sections of heat insulating material surrounding said heater, said sections being selectively movable, without disassembly, with respect to each other for regulating oven temperature.

4,295,034

HOT AIR GRILL

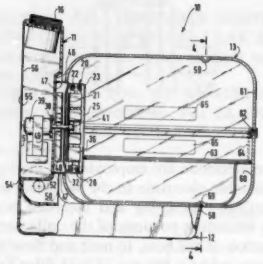
Jurgen Assmann, Michelbach, Fed. Rep. of Germany, assignor to Grossag GmbH, Fed. Rep. of Germany

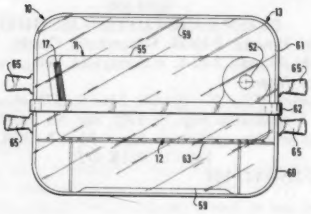
Filed Dec. 5, 1978, Ser. No. 966,571

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1977, 2754208

Int. Cl.[3] A37J *37/00*; A21B *1/22*

U.S. Cl. 219—400 **25 Claims**





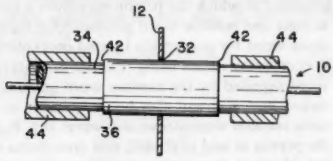
1. A portable hot air grill comprising a two-part base comprising a horizontal base portion and a vertical base portion foldably interconnected with one another, an electric motor mounted on said vertical base portion and having a horizontal shaft, a heating assembly projecting from said vertical base portion over said horizontal base portion and comprising a heater fan mounted on said motor shaft and an electric heating element in position to heat air blown by said fan, and a removable casing for receiving food stuff to be cooked, said horizontal base portion including means for removably supporting said casing thereon, and said casing being supported by removably resting by gravity on said horizontal base portion and having front, back, side, top and bottom walls of which at least said top wall is at least in part transparent, said back wall being unitary with said front and side walls and having an opening of a size and shape to receive said heating assembly when said casing rests on said horizontal base portion, said casing comprising at least two complementary, separable superposed parts which meet in a horizontal plane and have interfitting rim portions positioning said parts relative to one another when assembled one over another, said horizontal base portion and said casing having interfitting portions for positioning said casing in predetermined position on said horizontal base portion to receive said heating assembly through said opening said base being of a size to be received in said casing when in a folded-up condition.

4,295,035

DOUBLE-GRIP MOUNTING MEANS FOR SHEATHED HEATING ELEMENTS

Lester D. Drugmand, Arnold, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Filed Sep. 10, 1980, Ser. No. 185,994
Int. Cl.³ H05B *3/06*
U.S. Cl. 219—536 **6 Claims**



1. A double-grip mounting assembly for securing a sheathed metallic electric heating element to a metallic bracket having an aperture thereon, comprising in combination,

a sheathed metallic electric heating element including a linear portion disposed within the aperture of said bracket,

a tubular metallic insert of relatively thin material disposed within the aperture of said bracket and in surrounding relation to said heating element linear portion,

said insert including integrally therewith;

two radially outwardly extending flange-like portions, each one being disposed in snug axial relation and in direct contact with both sides of the said bracket adjacent to said aperture thereby to axially grip the bracket therebetween,

an axially extending tubular portion in surrounding concentric relation to said heating element connecting the radially inner extremity of said flange-like portions,

said flange-like portions respectively merging into axially adjacent reversely extending radially inwardly directed terminal flanges, with said terminal flanges in snug axial relation and in partial direct contact with the respective flange-like portions, and slightly flared at the bottom,

said terminal flanges at their radially inner extremities defining openings of lesser effective diameter than said insert tubular portion, thereby to mechanically engage the periphery of said sheathed metallic heating element and secure the bracket thereto in double-gripped relation.

4,295,036

TOY CASH REGISTER

Kwok W. Tsui, Wanchai, Hong Kong, assignor to Arco Industries Ltd., Hong Kong

Filed Apr. 25, 1980, Ser. No. 143,850
Int. Cl.³ G07G *1/00*
U.S. Cl. 235—1 E **10 Claims**

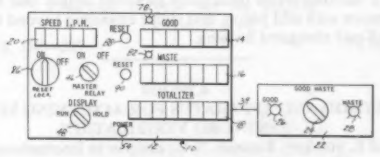
1. A toy cash register comprising in combination, a shell-like housing provided with an upstanding rear hollow portion and a forwardly and downwardly sloping upper surface section extending forwardly therefrom and positioned over a lower compartment, said sloping surface having a relatively large opening therein, a cash drawer slidable into and from a front opening in said lower compartment, latch means normally engaging complementary retaining means on said drawer within said compartment and spring means in said housing engaging said drawer to project it forwardly from said compartment when said latch is released, a rotatable register drum having money indicating indicia thereon enclosed within said upstanding rear hollow portion of said housing and operable about a horizontal axis therein, viewing means in a forward face of said upstanding rear portion of said housing within which indicia on said drum are viewable, a unitary cash key-simulating member having an area similar in size to said opening in said sloping surface and comprising a plurality of simulated cash keys upstanding thereon in fixed relation to each other in a bank arrangement and actuating means thereon extending from one end of said member into said upstanding portion of said housing and engageable with said rotatable register drum to rotate it, means pivotally connecting the opposite end of said key-simulating member to said housing for actuation thereof by depressing said member downwardly to effect rotation of said register drum, a release key pivotally supported by said housing and including means engageable with said latch means to disengage the same from said drawer and permit said spring means to project it to open position, and receipt-simulating member slidable forwardly through an opening in said housing upon actuation of said release key.

4,295,037

PRODUCTION COUNTER APPARATUS

Gary L. Miller, 16497 Terra Bella, Mt. Clemens, Mich. 48044

Filed Apr. 23, 1979, Ser. No. 32,124
Int. Cl.³ G06M *3/08*; G07C *3/10*
U.S. Cl. 235—92 PD **6 Claims**



1. Counting apparatus for a production machine producing parts having a plurality of distinct states, said counting apparatus comprising:

means for detecting the production of a part:

first switch means, responsive to operator selection, for selecting between each of said plurality of distinct states of said produced part;

a plurality of electronic counter means, each responsive to said detecting means and said first switch means, for respectively counting the number of occurrences of one of said distinct states of said produced parts; and

a plurality of display means, each responsive to one of said counter means, for displaying the current number of occurrences of one of said distinct states of said produced part;

second switch means switchable between first and second positions; and wherein

each counter means is responsive to said second switch means to hold the output signals transferred from said counter means to said display means at the state present when said second switch means is switched to said first position;

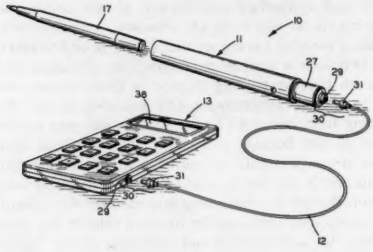
each of said counter means continuing to count the number of parts produced of a particular distinct state after said second switch means is switched to said first position so as to provide to the display means the total number of parts produced of a particular distinct state when said second switch means is switched to said second position.

4,295,038

MARKING AND COUNTING PROBE ASSEMBLY

Paul H. Kreinbrink, Temperance, Mich., and David C. Neiman, Waterville, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 10, 1979, Ser. No. 83,407
Int. Cl.³ G06M *11/00*
U.S. Cl. 235—92 PK **11 Claims**



1. A probe assembly for initiating electrical signals in seriatim for use in a counting apparatus comprising:

a. an elongated tubular housing having a transverse wall separating it into top and bottom sections, said sections being axially aligned;

b. a switch disposed in said top section for initiating electrical signals and including an axially extending plunger pin;

c. means disposed in said bottom section for operating said switch, said operating means including an axially reciprocal piston coaxially aligned with said plunger pin and engageable therewith for movement as a unit, said piston including an axial bore; and

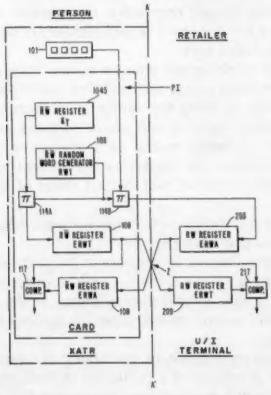
d. a marking stylus detachably mounted within said bore to move with said piston, said stylus extending beyond the end of said elongated housing.

4,295,039

METHOD AND APPARATUS FOR ACHIEVING SECURE PASSWORD VERIFICATION

Paul E. Stuckert, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1979, Ser. No. 99,797
Int. Cl.³ G06K *5/00, 19/06;* H04Q *9/00;* G06F *7/00*
U.S. Cl. 235—380 **18 Claims**



1. A personal identification system including the combination of a credit card-like device (CARD) to be presented by the holder of the CARD (Person), a Utilization Terminal (U/I Terminal) to which the CARD is presented for identification purposes, and a data interface for the exchange of predetermined data between the CARD and the U/I Terminal,

said CARD including means for permanently storing a secret key, K_T, unique to said person,

said combination further including,

encryption means comprising at least one key-controlled block-cipher encryption device located in said CARD,

a keyboard at which the person may enter a secret key, K_A, at least one random word generator for supplying a data input word for encryption by said encryption means,

said encryption means being operable to encrypt a random word supplied by the random word generator under the stored key, K_T, and also being operable to encrypt the same random word under said secret key, K_A, entered by the person at said keyboard, said encryption means utilizing identical encryption algorithms for each encyption operation,

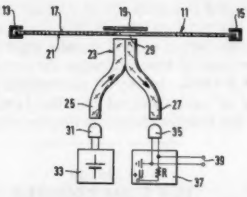
first comparison means in said Terminal for comparing the results of said first and second encryption operations and means for indicating a successful comparison.

4,295,040

DETECTOR ARRANGEMENT FOR DATA-CARD READERS

Daniel Berthier, Eybens, France, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 1, 1979, Ser. No. 8,306
Int. Cl.³ G06K *7/10, 7/14*
U.S. Cl. 235—458 **1 Claim**



1. A card reader for reading cards marked either by holes or by writing and providing an output indicative not only of the presence or absence of a mark but of the type of mark as well, the card reader comprising:

a light source emitting light toward a principal surface of a card to be read;

a reflective surface having a reflective power greater then that of the unmarked surface of the card and located parallel to an opposite surface of the card, for reflecting light reaching the reflective surface via a hole in the card back through the hole;

an optical detector for receiving light of a first intensity reflected from marks indicated by writing on the card, light of a second intensity greater than the first reflected from the unmarked surface of the card, and light of a third intensity greater than the second reflected from the reflective surface through marks indicated by holes in the card, and for producing a sense signal whose amplitude is indicative of the amount of light reaching the optical detector; and

level detection means coupled to the sense signal for producing an output signal having three distinct values respectively indicative of the presence of a mark produced by a hole, the presence of a mark produced by writing, and the absence of a mark.

4,295,041

DEVICE FOR THE PROTECTION OF ACCESS TO A PERMANENT MEMORY OF A PORTABLE DATA CARRIER

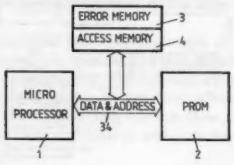
Michel Ugon, Saint-Ouen, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), France

Continuation-in-part of Ser. No. 936,694, Aug. 25, 1978, Pat. No. 4,211,919. This application Apr. 7, 1980, Ser. No. 137,973

Claims priority, application France, Aug. 26, 1977, 77 26107; Jul. 2, 1979, 79 17171

Int. Cl.³ G06K *19/06*

U.S. Cl. 234—487 **4 Claims**



1. A portable data carrier for storing and processing data, comprising:

a microprocessor;

a protected memory to which access is to be protected;

an access memory element of the electrically alterable read only memory type and an error memory element of the electrically alterable read only memory type;

said microprocessor including internal first elements for reading and writing in said protected memory, second elements for receiving external data to be written in said protected memory, and third elements for externally transmitting data read from said protected memory; and

said internal first elements including means for checking an enabling key received from a device external to said carrier, means for storing an error bit in said error memory element when the enabling key is incorrect, and means for storing an access bit in said access memory element when the enabling key is correct.

4,295,042

METHOD OF AND DEVICE FOR MEASURING CHLOROPHYLL OF LIVING LEAVES

Shigeru Watanabe, Tokyo, and Tatsuo Kuzunuki, Minamiashigara, both of Japan, assignors to Fuji Photo Film Co. Ltd., Minamiashigara, Japan

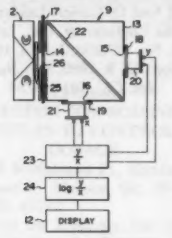
Filed Sep. 17, 1979, Ser. No. 76,475

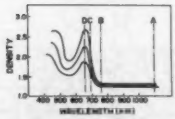
Claims priority, application Japan, Sep. 18, 1978, 53/114364

Int. Cl.³ G01J *3/34*

U.S. Cl. 250—226 **6 Claims**

1. A method for measuring the amount of chlorophyll contained in a leaf of a plant comprising the steps of causing light from a light source to pass through a leaf of a plant, dividing the light which has passed through the leaf into the first component of a shorter wavelength the amount of which changes with the amount of chlorophyll contained in the leaf and the second component of a longer wavelength the amount of which does not change with the amount of chlorophyll contained in the leaf, and measuring the amount of both the components at the same time to determined the amount of chlorophyll contained in the leaf based on the difference between said amount of both the components.





4,295,043

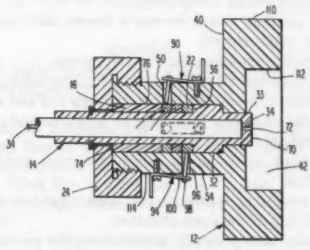
FIBER OPTIC CABLE CONNECTOR

Jules A. Eibner, Dresher, and Franz X. Kanamuller, Glenside, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,270

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—227 **7 Claims**



1. A connector which connects an optical cable to an electrical circuit, comprising:

a cable holder body;

a connector housing means formed to accept said cable holder body within and formed to locate a first end of said cable holder body in close proximity to a portion of said electrical circuit, said connector housing means being further formed to have access means;

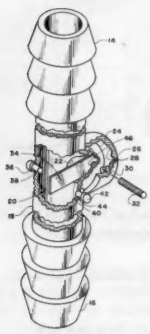
a length indication means for selecting a value of a predetermined parameter of said electrical circuit when said length indication means is connected to said electrical circuit, said value being related to the length of said optical cable, said length indication means disposed between a section of said cable holder body and said connector housing means and accessible from without through said access means; and

electrically conducting contact means attached to said connector housing means and formed to electrically connect said length indication means to said electrical circuit.

4,295,044
BEVERAGE FLOW SWITCH

Kenneth W. Anderson, Fremont, Calif.; Brent Summerhays, Logan, Utah, and Verl O. Cazier, Lander, Wyo., assignors to Electronic Systems Engineering, Inc., Logan, Utah

Continuation of Ser. No. 927,200, Jul. 24, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,273
Int. Cl.[3] G01D *5/34*
U.S. Cl. 250—229 9 Claims



1. A flow switch comprising

vertical conduit means having a lower, inlet means and an upper, outlet means;

a light path transecting the conduit means;

an open chamber extending outwardly from a side of the vertical conduit means and having an open end and a closed end with the open end providing an unobstructed opening into the vertical conduit means;

a stop means in the lower side of the open end of the open chamber;

pivotal mounting means in the open chamber adjacent the closed end of the open chamber;

an actuator arm pivotally mounted on the pivotal mounting means and extending into the vertical conduit means and resting against the stop, the actuator arm thereby extending horizontally into the vertical conduit means in obstruction of the light path, the actuator arm thereby being adapted to be moved upwardly from obstruction of the light path by flow of a liquid upwardly through the vertical conduit means between the lower, inlet means to the upper, outlet means, the actuator arm being adapted to be urged downwardly against the stop and across the light path by gravitational forces;

a light source on a first side of the vertical conduit means for transmitting light into the light path;

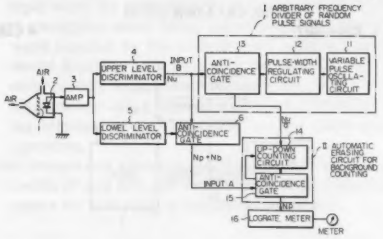
light detector means on a second side of the vertical conduit means for detecting light transmitted through the light path as the actuator arm is moved upwardly from obstruction of the light path as a result of upward light flow through the vertical conduit means; and

circuit means for electronically amplifying an electronic signal generated by the light detector means as a function of liquid flow through the vertical conduit means.

4,295,045
BACKGROUND COMPENSATION TYPE PLUTONIUM AIR MONITOR

Kentaro Minami, Oaraimachi, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Apr. 8, 1980, Ser. No. 138,406
Claims priority, application Japan, Apr. 28, 1979, 54-52030
Int. Cl.[3] G01V *5/00;* G01T *1/18*
U.S. Cl. 250—255 2 Claims



1. A background compensating plutonium air monitor comprising:

a detector for producing electrical signals in response to the incidence of radiation;

an upper level discriminator and a lower level discriminator, each responsive to said electrical signals and each having an output, wherein the output of the upper level discriminator has a higher rate than the output of the lower level discriminator;

an anti-coincidence gate connected to the output of both the upper level discriminator and the lower level discriminator and having an output;

an arbitrary freqency divider for frequency dividing signals from the upper level discriminator and having an output; and

an automatic erasing circuit connected to the output of said anti-coincidence gate and the output of said arbitrary frequency divider wherein the signals from the output of the arbitrary frequency divider are combined with the signals from the output of the anti-coincident circuit so as to erase background signals from the output of the anti-coincidence gate.

4,295,046
MASS SPECTROMETER

Karl Grüter, Brauweiler, and Jürgen Leineweber, Cologne, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 722,415, Sep. 13, 1976, abandoned. This application Sep. 8, 1978, Ser. No. 940,829
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1975, 2540505
Int. Cl.[3] B01D *59/44;* H01J *49/00*
U.S. Cl. 250—287 6 Claims

1. A transit time mass spectrometer for analyzing ions produced by pulsed laser radiation and having different energies, comprising, in combination:

(a) means forming a drift path to be traversed by the ions in a predetermined direction, said drift path comprising a cyclindrical section having an input end and an output end;

(b) an ion detector arranged downstream of said output end and having an entrance opening;

(c) an electrostatic lens system for focussing as well as for accelerating the ions and including a plurality of electrodes, including three which are in the form of cylindrical sections, one of said three electrodes being constituted by said cylindrical section serving as said drift path and the other two of said sections being arranged upstream of said input end, said lens system being a means for focussing onto said entrance opening only those ions which have a predetermined energy interval lying in the region of the maximum energy distribution;

(d) means for holding an ion-emitting test specimen which is to be subjected to the laser radiation, said holding means being constituted by that electrode of said lens system which is the furthest upstream of the input end of the drift path; and

(e) means forming an aperture diaphragm arranged between an ion-emitting test specimen which is held by said holding means and the next downstream cylindrical section, said diaphragm having an aperture which is as small as possible without impairing the ion flow, said diaphragm being at the same potential as said next downstream cylindrical section.

4,295,047

EMISSION COMPUTED TOMOGRAPH

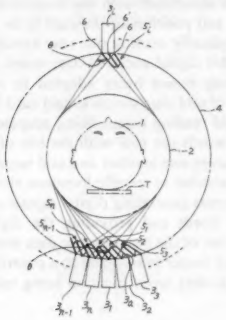
Kenichiro Koga; Yoshiharu Hirose, both of Kyoto; Iwao Kanno, Akita; Kazuo Uemura, Akita, and Shuichi Miura, Akita, all of Japan, assignors to Shimadzu Corporation, Japan

Filed Jan. 16, 1980, Ser. No. 112,787

Claims priority, application Japan, Jan. 23, 1979, 54-7390

Int. Cl.³ G01T *1/20;* **G21K** *1/04*

U.S. Cl. 250—363 S **9 Claims**



1. An emission computed tomograph comprising: means for supporting an object to be examined at a predetermined position, said object having taken therein a radionuclide that emits penetrating radiation such as X- or gamma radiation; a plurality of radiation detectors; means for supporting said detectors side by side along a circle about said predetermined position so that the radiation incident planes of said detectors face said object so as to receive radiation from said objects the position of each of said detectors being stationary relative to said object; a plurality of collimators; means for supporting said collimators between said predetermined position and said detectors so that each of said collimators is disposed in front of one of said detectors; each of said collimators comprising a pair of thin main plates made of a material capable of blocking penetration of said radiation therethrough, said main plates extending radially inwardly of said circle so as to define the direction in which said radiation from said object is incident on said radiation incident plane of said detector, and said main plates having an axis of rotation at a border between said radiation incident planes of each adjacent two of said detectors so that said main plates are swingable about said respective axes over a predetermined angle sufficient to cover the whole of said object; and means for causing said main plates of all said collimators to synchronously swing in the same direction and at the same angular speed thereby to scan the whole of the area in which the tomographic image of said object is to be reconstructed.

4,295,048

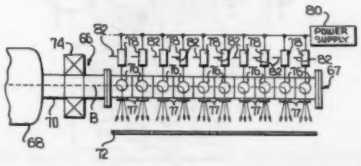
METHOD AND SYSTEM FOR SCANNING A BEAM OF CHARGED PARTICLES TO CONTROL IRRADIATION DOSAGE

Marshall R. Cleland, 9 Mohegan Pl., Huntington Station, N.Y. 11746, and Howard F. Malone, Sr., 35 Third Ave., Massapequa Park, N.Y. 11762

Filed Apr. 28, 1980, Ser. No. 145,061

Int. Cl.³ G01K *1/08;* **G01N** *23/00*

U.S. Cl. 250—398 **29 Claims**



1. A system for controlling the scanning of a beam of charged particles across a conveyor path to produce selective radiation dose at various locations comprising

particle accelerator means for producing a beam of charged particles;

deflecting means controllably operable to deflect said beam to a plurality of discrete positions across the conveyor path; and

control means coupled with said deflecting means to maintain said beam at each said discrete position for a preselected time in accordance with the radiation dose required at each said discrete position.

4,295,049

X-RAY DIAGNOSTIC GENERATOR WITH AN INVERTER SUPPLYING THE HIGH-TENSION TRANSFORMER

Otto Ebersberger, Erlangen, and Werner Kuehnel, Uttenreuth, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,549

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908767

Int. Cl.³ H05G *1/32*

U.S. Cl. 250—409 **10 Claims**

1. An x-ray diagnostic generator comprising

an inverter having an input and an output and having a controllable frequency of operation,

a high tension transformer having an input connected with the output of the inverter, and having an output,

a high tension rectifier having an input connected with the output of the high tension transformer, and having an output,

high tension capacitors connected at the output of the high tension rectifier,

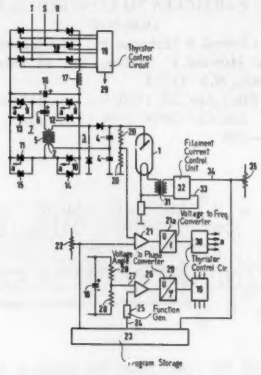
control loop means for receiving respective pairs of set point value signals in accordance with respective settings of x-ray tube voltage and current, and operable for sensing actual value signals in accordance with actual values of x-ray tube voltage and current and for controlling x-ray tube voltage and current to minimize errors between the settings of x-ray tube voltage and current, and the actual values thereof,

said control loop means comprising x-ray tube voltage con-

trol means (**7, 20, 21, 21*a*, 30**) connected with said inverter and operable to control inverter frequency to minimize the error between an x-ray tube voltage set point value signal and an x-ray tube voltage actual value signal, and

direct current supply means (**16-19**) connected with the input of said inverter (**7**) and operable for controlling the voltage supplied to said inverter,

program storage means (**23**) for supplying an optimum value signal in accordance with an optimum value of inverter



input voltage for each pair of settings of x-ray tube voltage and current to be received by said control loop means, and

inverter input voltage control means (**24-29**) connected with said direct current supply means (**16-19**) for setting the voltage supplied to said inverter (**7**) and connected with said storage means (**23**) and responsive to the optimum value signal therefrom to set the inverter input voltage at an optimum value during an operation of said generator with corresponding settings of x-ray tube voltage and current.

4,295,050

INSTRUMENT FOR POSITIONING AN X-RAY CAMERA IN DENTAL X-RAY PHOTOGRAPHY

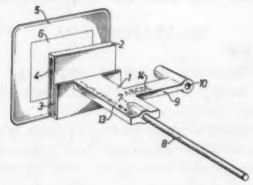
Sigurd Linden, Teatergatan 4, Linköping, Sweden

Filed Feb. 15, 1980, Ser. No. 121,880

Claims priority, application Sweden, Feb. 27, 1979, 7901788

Int. Cl.[3] **A61B** *6/14*

U.S. Cl. 250—479 **6 Claims**



1. An instrument for positioning the X-ray camera relatively the object and the X-ray film when taking X-ray photographs of teeth or adjacent tissues, comprising a plate-like member which at its one end, during the exposure of the film located inside the object as related to the camera, has a support for holding the film in a plane perpendicular to the longitudinal axis of said plate-like member, the outer end portion of the plate-like member being arranged, during exposure of the film, to be located outside the row of teeth of the patient and having a laterally extending arm-like portion located perpendicularly to the plate-like member and coplanar therewith, means being arranged to receive a guide pin in a position where its longitudinal axis is parallel to that of said plate-like member and said guide pin protrudes outside the oral cavity of the patient, whereby the optical axis of the X-ray camera objective can be positioned relatively said pin and, thence, relatively the film.

4,295,051

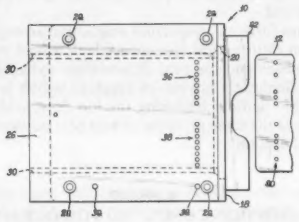
OPTICAL CARD READER

Fredy E. Graf; William M. Mahler, and Howard J. Malan, all of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed May 21, 1979, Ser. No. 40,571

Int. Cl.[3] **G06K** *7/10*

U.S. Cl. 250—569 **11 Claims**



1. An on-the-fly optical card reader for use with processing means for decoding multibit data words from a card as it is inserted therein and providing digital output signals corresponding to the data words encoded on the card, comprising:

frame means for supporting components of the reader and for mounting said reader;

guide means associated with the frame means for slidingly receiving and positioning the card to be decoded;

means for optically reading one row having at least two of said multibit digital encoded data words from said cards, said reading means being adapted to sequentially read each row of said data words as said card is inserted in said reader, said reading means being adapted to read at least two data words per row with the bits of each data word being adjacent one another and said words being separate from one another at specific locations along said row, said reading means generating digital signals corresponding to said data words and providing the digital signals of a complete one of the two or more data words at the output of said card reader in response to a control signal identifying a single data word location being selectively applied thereto.

4,295,052

CIRCUIT FOR MOTOR VEHICLES

Franz Jochmann, Munich, and Helmar Jedeck, Oberschleisheim, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 21, 1979, Ser. No. 22,632

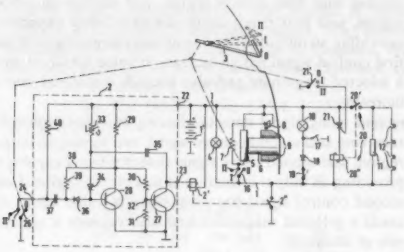
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812721

Int. Cl.[3] **B60R** *27/00*

U.S. Cl. 307—10 R **18 Claims**

1. A circuit arrangement for motor vehicles comprising circuit means responsive to operation of an actuating means of the motor vehicle for being energized, the actuating means including an actuating device of at least one of a door and flap lock of the motor vehicle, timer means responsive to the operation of the actuating device for providing a predetermined switching period, the circuit means being responsive to the elapse of the predetermined switching period of the timer means for being automatically de-energized, the circuit means

including at least one of a door and flap lock heater and at least one additional load means, the at least one additional load



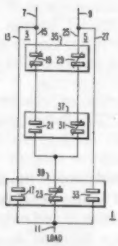
means being energized in response to the actuating means enabling opening of the motor vehicle.

4,295,053

ELECTRIC CONTROL SYSTEM WITH MECHANICAL INTERLOCK

George N. Kovatch, Monroeville, and James B. Wallace, Beaver, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 23, 1979, Ser. No. 87,365
Int. Cl.³ H02J *9/06*
U.S. Cl. 307—64 **7 Claims**



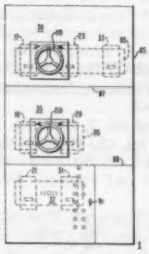
1. An electric control system for switching between supply lines extending to a load, comprising an isolation switching structure, a transfer switching structure, and a bypass switching structure; the isolation switching structure including first and second control devices, the transfer switching structure including third and fourth control devices, the bypass switching structure including fifth, sixth and seventh control devices, all of the control devices having contact carriers operable between open and closed circuit conditions; an emergency supply line including a first of two parallel paths extending to a load with one path including the first, third, and sixth control devices in series and with the other path including the fifth control device; a normal supply line including a second of two parallel paths extending to the load with one path including the second, fourth, and sixth control devices in series and with the other path including the seventh control device; and the bypass switching structure including interlock means including levers between the fifth, sixth, and seventh control devices for preventing closing of two control devices when one is previously closed.

4,295,054

ELECTRIC CONTROL SYSTEM WITH ROTARY MECHANICAL INTERLOCK AND TIMING MECHANISM

George N. Kovatch, Monroeville; George S. Bettencourt, Murrysville, and Otto H. Soles, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 23, 1979, Ser. No. 87,366
Int. Cl.³ H02J *9/00*
U.S. Cl. 307—80 **6 Claims**



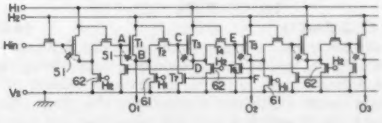
1. An electric control system for switching between two current supply lines extending to a load, comprising an isolation switching structure, a transfer switching structure, and a bypass switching structure; the isolation switching structure including first and second control devices, the transfer switching structure including third and fourth control devices, the bypass switching structure including fifth, sixth, and seventh control devices, all of the control devices being operable between open and closed circuit conditions; one of the current supply lines including a first of two parallel paths extending to the load with one path including the first, third, and sixth control devices in series and with the other path including the fifth control device; the other of the current supply lines including a second of two parallel paths extending to the load with one path including the second, fourth, and sixth control devices in series and with the other path including the seventh control device, the bypass switching structure including interlock timing means between the fifth, sixth, and seventh control devices for preventing simultaneous closing of one control device when another of the control devices is closed.

4,295,055

CIRCUIT FOR GENERATING SCANNING PULSES

Iwao Takemoto, Kodaira; Norio Koike, Tokyo; Shinya Ohba; Haruhisa Ando, both of Kokubunji; Masaaki Nakai, Hachioji; Syoji Hanamura; Ryuichi Izawa, both of Kokubunji; Masaharu Kubo; Masakazu Aoki, both of Hachioji, and Shuhei Tanaka, Higashiyamato, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 6, 1979, Ser. No. 46,028
Claims priority, application Japan, Jun. 12, 1978, 53/69793
Int. Cl.³ H03K *21/00*
U.S. Cl. 307—221 C **29 Claims**



1. A circuit for generating scanning pulses comprising a plurality of stages of basic circuits connected in series, said each basic circuit comprising first, second and third insulated gate field-effect transistors (MISTs) each of which has first and

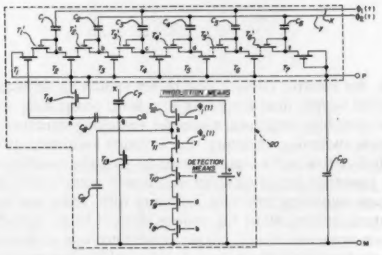
second terminals each being either of source and drain terminals and a gate terminal, said first terminal of said first MIST being used as a clock pulse-applying terminal, said gate terminal of said first MIST being used as an input terminal, said second terminal of said first MIST and said first terminal and said gate terminal of said second MIST being connected and used as a scanning pulse output terminal, said second terminal of said second MIST and said first terminal of said third MIST being connected and used as an output terminal, said second terminal of said third MIST being used as a ground terminal, said gate terminal of said third MIST being used as a feedback input terminal.

4,295,056

INTEGRATED FREQUENCY DIVIDER

Jacob Luscher, Venthone, Switzerland, assignor to Ebauches S.A., Switzerland

Filed Jul. 2, 1979, Ser. No. 54,230
Int. Cl.³ H03K *21/00, 5/13*
U.S. Cl. 307—221 C **10 Claims**



1. A frequency divider circuit for two periodic signals in phase opposition comprising, integrated in a semi-conductor substrate, a first shift register comprising a plurality of transistors and capacitors which form a plurality of cells connected one after the other, each cell being constituted by two identical stages which are connected in series and are supplied, in use, by the two periodic signals respectively, first detection means for detecting a particular state of the register, and first production means, responsive to the detecting of the said state to produce a first signal with a frequency which is a sub-multiple of that of the said periodic signals, and wherein each stage of the shift register comprises an MOS transistor structure which has two principal electrodes respectively forming the input and output of the stage and two control electrodes, one of which is, in operation, connected to a bias source and the other of which is connected to the output principal electrode, and a capacitor, one plate of which is connected to the said output electrode and the other plate of which receives one of the said periodic signals.

4,295,057

DUAL SIGNAL CONTROL SYSTEM

Thomas E. Hendrickson, Wayzata, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 8, 1979, Ser. No. 92,785
Int. Cl.³ H03K *5/22, 5/00*
U.S. Cl. 307—231 **16 Claims**

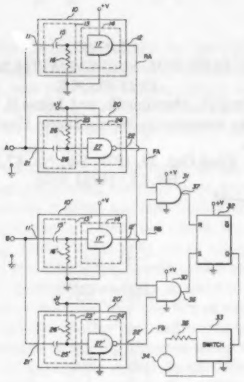
1. An electronic switching circuit receiving first and second control signals, said electronic switching circuit being capable of providing a logic output signal having a phasing of value changes therein similar to that phasing of changes in value of a selected one of said first and said second control signals for those changes of said selected signal which are sufficient in magnitude and rate of change, but only for each such change in said selected signal which is accompanied by a change of value in an opposite direction in that remaining one of said first and second control signals occurring sufficiently concurrently therewith, said electronic control circuit comprising:

a first rising signal detector having an input region for receiving said first control signal, and having an output region, said first rising signal detector being capable of providing an output indication at said output region if said first control signal has an increase in value which exceeds a selected magnitude and also exceeds a selected rate of increase;

a second rising signal detector having an input region for receiving said second control signal, and having an output region, said second rising signal detector being capable of providing an output indication at said output region if said second control signal has an increase in value which exceeds a selected magnitude and also exceeds a selected rate of increase;

a first falling signal detector having an input terminal for receiving said first control signal, and having an output region, said first falling signal detector being capable of providing an indication at said output region if said first control signal has a decrease in value which exceeds a selected magnitude and also exceeds a selected rate of decrease;

a second falling signal detector having an input region for



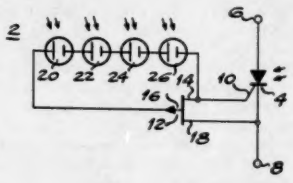
receiving said second control signal, and having an output region, said second falling signal detector being capable of providing an indication at said output region if said second control signal has a decrease in value which exceeds a selected magnitude and also exceeds a selected rate of decrease; and

a logical sorting means having a first input connected to said first rising signal detector output region, a second input electrically connected to said second rising signal detector output region, a third input electrically connected to said first falling signal detector output region, and a fourth input electrically connected to said second falling signal detector output region, and with said logic sorting means having an output region, said logic sorting means being capable of providing said electronic switching circuit logic output signal at said logical sorting means output region in a first state when output indications occur substantially concurrently at said first rising signal detector output region and said second falling signal detector output region, and of providing said electronic switching circuit logic output signal at said logical sorting means output region in a second state when output indications occur substantially concurrently at said first falling signal detector output region and said second rising signal detector output region.

4,295,058
RADIANT ENERGY ACTIVATED SEMICONDUCTOR SWITCH

Robert W. Lade, Charlotte Amalie, V.I.; Gordon B. Spellman, Mequon, Wis.; Stanley V. Jaskolski, Sussex, Wis.; Herman P. Schutten, Elm Grove, Wis., and James R. Jaeschke, Waukesha, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 7, 1979, Ser. No. 46,568
Int. Cl.³ H03K *17/72, 17/94, 17/687*
U.S. Cl. 307—252 A **29 Claims**



1. A radiant energy activated semiconductor switching device comprising in combination:

a semiconductor switch having a plurality of alternating conductivity type regions, including a pair of end regions and a middle control region, and switchable from a low current OFF state to a high current ON state between said end regions by a triggering signal applied to said control region;

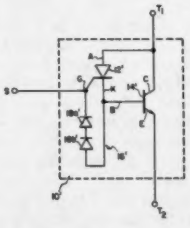
normally conductive variable conductance means connected between said control region and one of said end regions of said switch, said variable conductance means having a control terminal for varying the conduction value thereof between a conductive state and a state having greater conductivity, said normally conductive variable conductance means being conductive when no potential is applied to said control terminal and being less conductive when potential is applied to said control terminal, the requisite magnitude of said triggering signal decreasing as the conduction of said variable conductance means decreases; and

transducer means connected to said control terminal of said variable conductance means and responsive to impinging radiant energy to develop an electrical bias potential which biases said variable conductance means and decreases the conduction value thereof.

4,295,059
HIGH GAIN LATCHING DARLINGTON TRANSISTOR

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,383
Int. Cl.³ H03K *17/12, 17/60, 17/72*
U.S. Cl. 307—253 **2 Claims**



1. A high gain latching Darlington transistor having increased dv/dt capability comprising:

(a) a four-layer PNPN semiconductor switching device having a gate, a cathode, and an anode electrode, said four-layer PNPN semiconductor switching device conducting current through the anode-cathode portion thereof in accordance with the polarity of the gating pulse signals applied to said gate electrode;

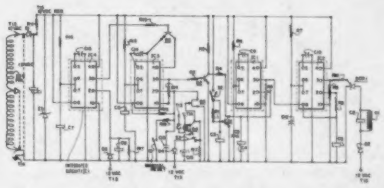
(b) a load transistor having a base, a collector, and an emitter electrode, said load transistor coupled in Darlington configuration to said four-layer PNPN semiconductor switching device, said load transistor conducting substantial load current through the collector-emitter portion thereof in response to current conduction through said four-layer PNPN semiconductor switching device; and

(c) first and second diodes coupled in inverse series aiding fashion between the gate electrode of said 4-layer PNPN semiconductor and the junction of said 4-layer PNPN semiconductor and said load transistor base electrode.

4,295,060
SOLID STATE TRIGGERING CIRCUIT

Richard S. McGehee, 1509 Crawford La., Hanover Park, Ill. 60103

Filed Sep. 20, 1979, Ser. No. 77,347
Int. Cl.³ H03K *3/284, 3/42*
U.S. Cl. 307—273 **10 Claims**



1. An electronic triggering circuit comprising: light sensing circuit means for providing a first electrical signal responsive to a predetermined interruption of light exposure, RC time delay circuit means having discharging capacitor means and providing an electrical output signal following a predetermined time delay from the receipt of an electrical input signal, said predetermined time delay provided by the electrical discharge of said discharging capacitor means, first monostable electronic circuit means connected to receive the first electrical signal of the light sensing circuit means and being activated thereby for providing a predetermined ON time period and further providing a first electrical output signal during the ON time period comprising the electrical input signal to the RC time delay circuit means, said first monostable circuit means including RC time constant means with charging capacitor means biasing the first monostable circuit means after a first predetermined charging time period to switch to an OFF electrical state whereby the first electrical output signal is discontinued, the first predetermined charging time period of the first monostable circuit means exceeding the discharging time period for the RC time delay circuit means, second monostable electronic circuit means connected to receive as an input signal thereto the electrical output signal from the RC time delay circuit means, said second monostable circuit means having a predetermined ON time period and providing a second electrical output signal during the ON time period, and including RC time constant means with charging capacitor means biasing the second monostable circuit means after a second predetermined charging time period to switch to an OFF electrical state whereby the second electrical output signal is discontinued, and third monostable electrical circuit means connected to receive as an input signal thereto the second electrical output signal from the second monostable circuit means, said third monostable circuit means having a predetermined ON time period and providing a third electrical output signal during the ON time period, and including RC

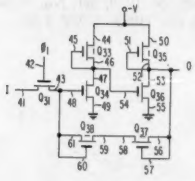
time constant means with charging capacitor means biasing the third monostable circuit means after a third predetermined charging time period to switch to an OFF electrical state whereby the third electrical output signal is discontinued, and the second predetermined charging time period exceeding the third predetermined charging time period whereby the third monostable circuit means is disabled to provide said third electrical output signal during the continued charging time period for the second monostable circuit means, and the third electrical output signal comprising the electrical output triggering signal of the electronic triggering circuit.

4,295,061

LATCH CIRCUIT

Saburo Tokoda; Koichiro Okumura, and Eiji Sugimoto, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1979, Ser. No. 21,281
Claims priority, application Japan, Mar. 16, 1978, 53/30773
Int. Cl.³ H03K *5/26*
U.S. Cl. 307—279 **6 Claims**



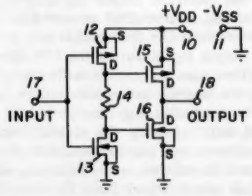
1. A circuit comprising a first inverter circuit having input and output terminals, means for applying an input signal to the input terminal of said first inverter circuit, a second inverter circuit having an input terminal coupled to the output terminal of said first inverter circuit and having an output terminal, and feed-back means coupled between said input terminal of the first inverter circuit and said output terminal of the second inverter circuit, said feed-back means including a first insulated-gate field-effect transistor having a drain, a gate and a source, the drain and gate of said first transistor being commonly coupled to the output of said second inverter circuit, and a second insulated-gate field-effect transistor having a gate, a drain and a source, the source of said second transistor being coupled to the source of said first transistor, the gate and drain of said second transistor being commonly coupled to the input terminal of said first inverter circuit.

4,295,062

CMOS SCHMITT TRIGGER AND OSCILLATOR

Stephen K. Mihalich, Santa Clara, and Thomas S. W. Wong, Sunnyvale, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 2, 1979, Ser. No. 26,277
Int. Cl.³ H03K *3/295, 3/354, 4/48*
U.S. Cl. 307—279 **9 Claims**



1. A complementary metal oxide semiconductor trigger circuit having a non-inverting signal transfer characteristic that displays hysteresis, said circuit having first and second power supply rails connectible to a source of operating voltage and comprising:

a resistor having a value that is large with respect to the on resistance of an active transistor and having first and second terminals;

a first P channel transistor having a source coupled to said first supply rail, a drain coupled to said first resistor terminal, and a gate;

a second N channel transistor having a source coupled to said second supply rail, a drain coupled to said second resistor terminal, and a gate;

means for coupling said gates of said first and second transistors together to comprise an input terminal to said circuit;

a third P channel transistor having a source coupled to said first supply rail, a gate coupled to said drain of said first transistor, and a drain;

a fourth N channel transistor having a source coupled to said second supply rail, a gate coupled to said drain of said second transistor, and a drain; and

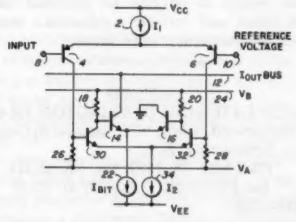
means for coupling said drains of said second and third transistors together to comprise an output terminal to said circuit whereby the output signal is responsive to the potential difference developed between said first and second resistor terminals to provide first and second logic state output signals, said first logic state being produced when said input terminal is operated at a potential that lies between the potential of said first supply rail and the threshold potential of said first transistor and said second logic state being produced when said input terminal is operated at a potential that lies between the potential of said second supply rail and the threshold potential of said second transistor.

4,295,063

FAST SETTLING DIGITAL TO ANALOG CONVERTER BIT SWITCH

John J. Price, Jr., Mesa, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 28, 1979, Ser. No. 53,131
Int. Cl.³ H03K *5/153, 17/02*
U.S. Cl. 307—362 **2 Claims**



1. A current bit switch for use in a digital to analog converter for directing a bit current generated by a first current source to an output bus, comprising:

a first differential pair of switching devices for receiving a reference voltage and a digital input signal, said digital input signal capable of assuming first and second states;

a second differential pair of switching devices for directing said bit current onto said output bus when said input signal is in said first state;

a third differential pair of switching devices having an input coupled to said first pair and having an output coupled to said second pair for reducing overshoot caused by fast transitions of said input signals between said first and second states,

a second current source for supplying current to said first

pair of switching devices; and a third current source coupled to said third pair of switching devices,

said first differential pair of switching devices comprising first and second emitter coupled transistors, said first transistor having a base coupled to said input signal and having a collector coupled to said third differential pair and said second transistor having a base coupled to a reference voltage and a collector coupled to said third differential pair,

said third differential pair comprising third and fourth emitter coupled transistors, the base of said third transistor coupled to the collector of said first transistor and to a first source of supply voltage and the collector of said third transistor coupled to a second source of supply voltage, the base of said fourth transistor coupled to the collector of said second transistor and to said first source of supply voltage and the collector of said fourth transistor coupled to said second source of supply voltage, the common emitters of said third and fourth transistors coupled to said third current source, and

said second differential pair comprising fifth and sixth emitter coupled transistors, said fifth transistor having a base coupled to the collector of said third transistor and to said second source of supply voltage and having a collector coupled to said output bus, and said sixth transistor having a base coupled to the collector of said fourth transistor and to said second source of supply and having a collector coupled to ground, the emitters of said fifth and sixth transistors coupled to said first current source, and

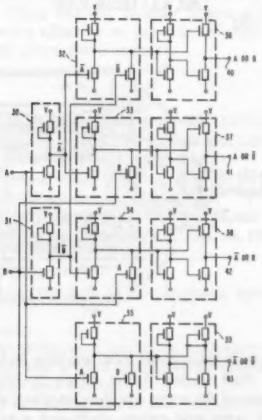
said first and second transistors being PNP transistors and said third, fourth, fifth and sixth transistors being NPN transistors.

4,295,064

LOGIC AND ARRAY LOGIC DRIVING CIRCUITS

Stanley E. Schuster, Granite Springs, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,943
Int. Cl.³ H03K *19/173, 19/20, 19/094*
U.S. Cl. 307—468 **3 Claims**



1. A prearray logic section of a programmed logic array having a partitioning logic circuit wherein each logical input variable is combined and duplicated to provide a separate output for each of all possible logical combinations of all logical input variables and wherein each said output having a driver circuit comprising:

a first FET transistor having its source connected to the reference potential of said logic circuit and having its drain connected through a load device to a drive voltage;

means connecting the input to the gate of said first FET transistor;

a second and a third FET transistor of the type exhibiting no conduction in the "off" condition connected in series source-to-drain with said second FET transistor adjacent to the reference potential of said logic circuit and said third FET transistor adjacent to a drive voltage;

means connecting the output to the junction between said second and third series connected FET transistors;

means connecting the input to the gate of said third series connected FET transistor; and

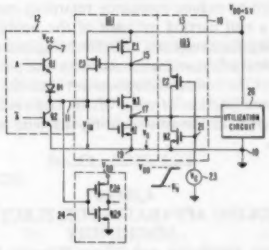
means connecting the output of said first FET transistor to the gate of said second FET transistor.

4,295,065

LEVEL SHIFT CIRCUIT

Peter K. Hsieh, Parsippany, and Richard M. Vaccarella, Raritan, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 13, 1979, Ser. No. 65,841
Int. Cl.³ H03K *19/092, 19/094, 19/20*
U.S. Cl. 307—475 **18 Claims**



1. The combination comprising:

first and second power terminals for the application therebetween of an operating potential;

an input terminal adapted to receive input signals having either a first value approximately equal to the potential applied to said first power terminal or a second value equal to a voltage intermediate the voltages applied to said first and second power terminals;

a level shift control node, and an output node;

a first input signal responsive means including means connected between one of said first and second power terminals and said output node and between said output node and said level shift control node for clamping said one of said first and second terminals to said output node and said output node to said level shift control node for one value of input signal and decoupling said one of said first and second terminals from said output node and said output node from said level shift control node for the other value of input signal;

a second, normally non-conductive, input signal responsive means for clamping said level shift control node to said other one of said first and second power terminals for the other value of input signal; and

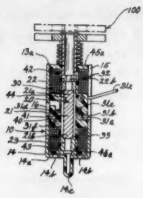
regenerative feedback means responsive to the voltage at said level shift control node for clamping said input terminal to said second power terminal in response to input signals of said second value.

4,295,066

ELECTROMAGNETIC ACTUATOR

C. F. Lloyd, Rexdale; Z. Leo Zalewski, Brampton, and Paul C. Brendle, Mississauga, all of Canada, assignors to CTS Corporation, Elkart, Ind.

Filed Jan. 11, 1980, Ser. No. 111,398
Int. Cl.³ H02K *33/12*
U.S. Cl. 310—30 **10 Claims**



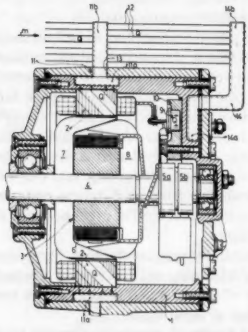
1. In an electromagnetic actuator, the combination comprising a housing of magnetizable material, a bobbin supported by the housing and provided with an interior bore, an armature supported in the interior bore for movement relative to the housing, the armature being provided with a magnet and a pair of spaced magnetic poles, the bobbin comprising a pair of bobbin sections, an inner rim and an outer rim secured to each of the bobbin sections, and means connecting the bobbin sections, the interior bore extending through the sections and the means connecting the sections, a radial bore being provided in the means connecting the sections and communicating with the interior bore to reduce resistance retarding movement of the armature, a coil carried by each of the bobbin sections and circumposing the armature, the coils being associated with the magnet poles, a first and a second wire end portion extending from each of the coils and disposed between the inner rims, the first wire end portion of each of the coils being electrically interconnected, and means securing the wire end portions to the bobbin.

4,295,067

COOLING APPARATUS FOR ELECTRICAL MACHINERY

Georg Binder, Bechhofen, and Günter Wössner, Esslingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 7, 1979, Ser. No. 10,049
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2810222
Int. Cl.³ H02K *9/00*
U.S. Cl. 310—52 **12 Claims**



1. In a d-c generator, particularly automotive alternator having

a housing (1);

a stator structure (2) having stator windings thereon located in the housing;

a rotor structure (3) including a rotor shaft (4) rotatably positioned within the housing to rotate with respect to the stator;

a heat pipe structure including

heat pipe cooling means (11, 14, 15, 18, 21, 21*b*, 24, 24', 30, 34, 36) to cool the stator windings on the stator structure including means (11*a*, 14*a*, 15*a*, 18*a*, 21*a*, 24*a*, 24*a'*, 30*a*, 34*a*, 36*a*) 36*a'*, 41, 42, 41', 42') for forming an evaporation chamber and means (11*b*, 14*b*, 15*b*, 18*b*, 21*d*, 21*f*, 24*b*, 27, 30*b*, 33, 36*b*, 39, 39') for forming a condensation chamber in fluid communication with said evaporation chamber,

and an evaporatable fluid contained in said chambers

and wherein, in accordance with the invention,

the evaporation chamber forming means (11*a*, 14*a*, 15*a*, 18*a*, 21*a*, 24*a*, 24*a'*, 30*a*, 34*a*, 36*a*, 36*a'*, 41, 42, 41', 42') are positioned adjacent the stator structure (2) and in heat transfer relation thereto;

the condensation chamber forming means are secured externally of the housing and in a location at which the temperature is low with respect to that of the stator windings;

a sequence of multiple and mutually communicating heat pipes is provided in communication with, and interconnecting said chambers;

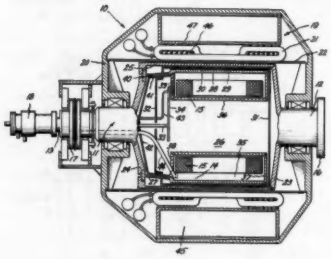
and said shaft (4) consists of a fan-less or ventilator wheel-less construction.

4,295,068

CANTILEVERED FIELD WINDING SUPPORT FOR A SUPERCONDUCTING AC MACHINE

Bruce B. Gamble, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 18, 1979, Ser. No. 40,172
Int. Cl.³ H02K *9/00*
U.S. Cl. 310—52 **12 Claims**



1. In a superconducting electrical machine including a rotor comprising a shaft adapted to be driven in rotation about a longitudinal axis of the rotor, a hollow undriven shaft disposed concentrically with said driven shaft and a hollow axially central portion disposed concentrically with and attached to each of said shafts, and a torque tube and at least one superconducting winding disposed within said hollow central portion; a support means for said torque tube and said field winding comprising:

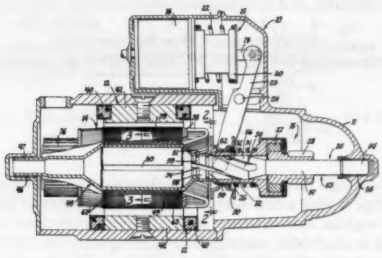
means for supporting said torque tube and said superconducting winding within said central portion and substantially concentrically with said rotor shafts in cantilever fashion from one of said shafts.

4,295,069

ARMATURE SHAFT FOR A VEHICLE STARTER MOTOR

David E. Givan, Anderson, and Charles R. Ashton, Middletown, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 17, 1978, Ser. No. 897,109
Int. Cl.[2] H02K 7/00
U.S. Cl. 310—67 R 3 Claims



1. An armature shaft for a motor vehicle engine starter motor assembly of the type having an axially movable clutch and pinion drive assembly splined to the armature shaft for rotation therewith, the armature shaft comprising, in combination:

a tubular member having an open end and another end and being adapted to receive armature core laminations thereon; and

a solid cylindrical member having one end provided with at least one spiral spline groove adapted for engagement with the clutch and pinion drive assembly and another end, the other ends of the tubular and solid cylindrical members comprising the opposite ends of the armature shaft, the one end of the cylindrical member being received coaxially in the open end of the tubular member, the open end of the tubular member having at least one portion thereof radially staked into the spline groove, whereby the tubular and cylindrical members are joined to each other, the portions of the open end of the tubular member which are not radially staked into the spline groove being effective to provide an axial stop for the clutch and pinion drive assembly.

4,295,070

MEANS FOR PROVIDING A MECHANICALLY DEFINABLE SELECTED TRIGGER INTERVAL IN A FLYWHEEL MAGNETO

Sven H. Johansson, Amal, Sweden, assignor to Aktiebolaget Svenska Elektromagneter, Amal, Sweden

Filed Jun. 14, 1979, Ser. No. 48,685
Claims priority, application Sweden, Jun. 16, 1978, 7806971
Int. Cl.[3] H02K 21/22
U.S. Cl. 310—70 R 1 Claim

1. A flywheel magneto in an electronic ignition circuit, including:

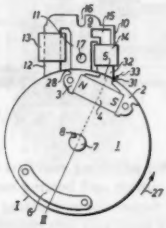
(a) a flywheel;

(b) a ferromagnetic core having in succession a first leg, a second leg, and a third leg, each leg terminating at the periphery of said flywheel;

(c) a trigger coil in said circuit and carried on said first leg, and a charging coil carried on said third leg;

(d) a pair of magnetic pole shoes and a permanent magnet disposed between said shoes and jointly molded into said flywheel, said pole shoes being disposed at the periphery of said flywheel in magnetic circuit with said permanent magnet, a first of said shoes, situated first in the direction of rotation of said flywheel, having such extent that its flux can coact with said first and second legs in one position, said first pole shoe having a notch underlying its leading edge for limiting initial flux transfer to said second leg, the leading edge of said one shoe being sharply defined, the leading edge of a second of said shoes, thereafter, coming to the first encountered edge of said first leg where the magnetic flux of said second shoe begins to coact with magnetic flux in said second leg;

(e) a first-encountered edge of each of said first and second legs being sharply defined and registering with the path of movement of said pole shoes; and



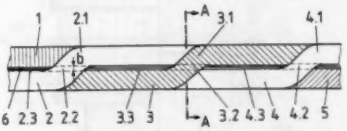
(f) the distance between said leading edges defining the duration of a triggering signal induced in said trigger coil, said signal beginning in response to said leading edge of said first shoe encountering the first-encountered edge of said second leg, and said signal ending in response to said leading edge of said second shoe encountering the first-encountered edge of said second leg.

4,295,071

LATTICE BAR FOR ELECTRICAL MACHINERY

Ernst Kaspar, Birr, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Apr. 5, 1979, Ser. No. 27,408
Claims priority, application Switzerland, Apr. 6, 1978, 3691/78
Int. Cl.[3] H02K 3/14
U.S. Cl. 310—213 7 Claims



1. In a lattice bar for electrical machinery comprised of a plurality of transposed flat copper conductors insulated from each other and having bending portions along their length, the improvement wherein a notch is provided in only one flat side of each transposed conductor, each notch extending approximately longitudinally of an extended edge of its respective transposed conductor over the entirety of the bending portion of the conductor.

4,295,072

FIELD EMISSION ELECTRON GUN WITH ANODE HEATER AND PLURAL EXHAUSTS

Hideo Todokoro, Hinodemachi, and Yoshio Sakitani, Ohimachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

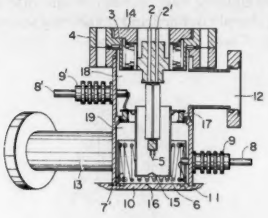
Filed Feb. 1, 1979, Ser. No. 8,259
Claims priority, application Japan, Feb. 8, 1978, 53-13722[U]
Int. Cl.[3] H01J 7/16
U.S. Cl. 313—7 7 Claims

1. A field emission electron gun comprising:

a field emission cathode;

an anode having an aperture through which an electron beam emitted by said cathode can pass;

heating means for heating said anode;
a first chamber in which said cathode is disposed;
first exhaust means for evacuating said first chamber;



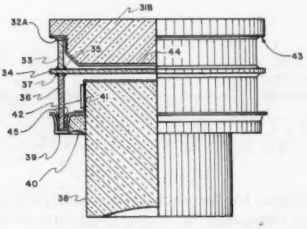
a second chamber adjoining said first chamber through said anode and in which said heating means is disposed, and
second exhaust means for evacuating said second chamber independently from said first chamber.

4,295,073

MICROCHANNEL PLATE-IN-WALL STRUCTURE

Charles F. Freeman, Springfield, and Kurt Villhauer, Annandale, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 28, 1978, Ser. No. 890,899
Int. Cl.[3] H01J *43/22, 43/28*
U.S. Cl. 313—105 CM **9 Claims**



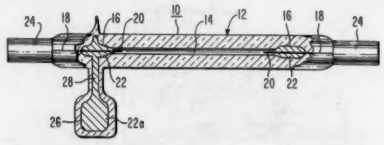
1. A microchannel plate-in-wall structure comprising:
a microchannel plate consisting of semiconducting glass, having anode and cathode surfaces and a plurality of electron multiplier channels therebetween;
at least one continuous thin planar electrode deposited on each of said surfaces, said electrode extending substantially to the edge of said plate as well as adjacent to and surrounding one end of at least one of said channels; and
a first hollow generally cylindrical glass wall section axially positioned normal to one of said surfaces and sealed with glass directly to said electrode and plate, said wall section at said surface having a minimum cross-section which encloses all of the ends of said channels at said one surface, and a maximum cross-section smaller than said one surface, whereby said one plate surface and each said one thin planar electrode it supports is divided into a pair of exposed portions which lie on opposite sides of said wall interconnected by a third portion sealed between said wall and said plate.

4,295,074

MERCURY ARC LAMP HAVING COMMUNICATING MERCURY RESERVOIR

Frank R. Ragland, Jr., Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 21, 1979, Ser. No. 22,617
Int. Cl.[3] H01J *61/28, 61/30*
U.S. Cl. 313—174 **5 Claims**



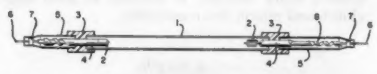
1. In a high pressure mercury discharge device including an envelope having a first internal bore including a pair of spaced apart regions, said envelope having lead-in conductors terminating in electrodes, said conductors being sealed in said envelope and extending through said regions, and having pools of mercury retained within said regions around said electrodes, the improvement comprising
at least one chamber having a reservoir of mercury therein, and a second integral bore communicating between said chamber and one of said regions, said chamber being substantially larger than second integral bore, said chamber being remote from said regions whereby said chamber can be selectively heated or cooled independently of said regions to vary the impedance of said device.

4,295,075

ARC DISCHARGE LAMP HAVING CERAMIC ARC TUBE

Edward A. Webb, Reading; John F. McKenna, Newburyport, both of Mass., and Frank B. Makar, Jr., Plaistow, N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 14, 1979, Ser. No. 103,659
Int. Cl.[3] H01J *17/16*
U.S. Cl. 313—220 **5 Claims**



1. An arc discharge lamp comprising: a ceramic arc tube having an electrode at each end, each electrode being mounted on a support member; a ceramic cylinder at each end of the arc tube, the arc tube fitting inside one end of the ceramic cylinder and being sealed thereto; a ceramic adapter fitting into the other end of the ceramic cylinder and being sealed thereto; a lead-in wire extending into, and externally of, the ceramic adapter and being sealed thereto; the support member extending through the ceramic cylinder into the ceramic adapter and being sealed to the ceramic cylinder; and a spiral refractory-metal conductor disposed within the ceramic adapter and electrically connecting the support member to the lead-in wire.

5. The method of making an arc discharge lamp comprising the steps of: preparing an arc tube assembly including an arc tube, a ceramic cylinder sealed to the arc tube, a ceramic adapter sealed to the ceramic cylinder, and an electrode within the arc tube mounted on a support member extending into the adapter where it is connected to a lead-in wire extending externally of the adapter through a small clearance hole in a disc which is sealed to the adapter a short distance from the end thereof; disposing a glass bead around the lead-in wire at the end of the adapter; placing the arc tube assembly into a chamber and filling the chamber with a nonoxidizing gas to a predetermined pressure; heating the glas bead to its softening temperature; raising the pressure within the chamber; and heating

the glass bead to its sealing temperature to effect a heremetic seal between the lead-in wire and the disc.

4,295,076
ELECTRIC LAMP WITH CEMENTLESS ATTACHED BASE

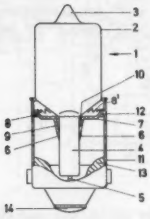
Fritz Eckhardt, Bolheim, and Walter Schönherr, Giengen, both of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen m.b.H., Munich, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,371

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814461

Int. Cl.³ H01K *1/46*

U.S. Cl. 313—223 **12 Claims**



1. Electric lamp having
a bulb (**2**), a glass press stem (**4**) projecting from the bulb, and lead wires (**5**) projecting from the stem
in combination with a cylindrical lamp base shell (**11**) open at one end for insertion of the press stem and having
internally projecting locating means (**12**) and
a generally smooth interior surface in the region between the open end and said locating means; and
means securing the bulb (**2**) to the lamp base shell (**11**) comprising;
a resilient disk-shaped element (**7**) formed with an upwardly bent notched or serrated edge (**8**) having serration points (**8'**), the points (**8'**) of the notched or serrated edge being engaged against the generally smooth interior surface of the lamp base shell;
the disk-shaped element mechanically engaging the press stem essentially centrally of the disk-shaped element,
said lead wires being soldered to base contacts (**14, 214**) on the base shell.

4,295,077
CIRCUMFERENTIALLY APERTURED CYLINDRICAL GRID FOR ELECTRON TUBE

Don R. Carter, Lancaster; Claude E. Doner, New Providence; Fred G. Hammersand, East Petersburg, and Joseph R. Tomcavage, Lancaster, all of Pa., assignors to RCA Corporation, New York, N.Y.

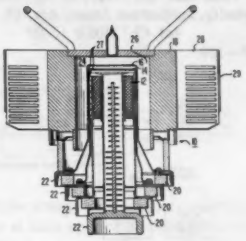
Filed Feb. 14, 1980, Ser. No. 121,530

Int. Cl.³ H01J *1/46, 21/10*

U.S. Cl. 313—293 **7 Claims**

1. In a high power electron tube having a cathode, a cylindrical anode circumscribing said cathode and at least one tubular electrode disposed between said cathode and said anode, said electrode being formed from a cylindrical member closed at one end, said member having an outside diameter D, said member further having a plurality of first apertures extending therethrough, each of said first apertures having a length x and a width y, the improvement wherein said electrode comprises:
spurious oscillation control means including said first apertures, wherein said first apertures are circumferentially elongated, the length x, of said first apertures being greater than the width y, and wherein the length x of said first apertures is not greater than 0.55 times the diameter D, of said one electrode.

6. In a high power electron tube having a cathode, an anode and at least one tubular electrode disposed between said cathode and said anode, said tubular electrode being closed at one



end and having a plurality of apertures extending through the tubular portion thereof, the improvement comprising the apertures in said tubular electrode being circumferentially elongated, the length of said apertures being not greater than 0.55 times the diameter of said tubular electrode whereby spurious oscillations are controlled.

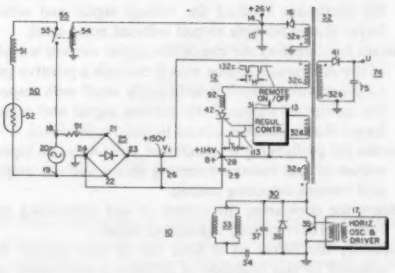
4,295,078
COLOR TELEVISION RECEIVER DEGAUSSING CIRCUIT

Paul C. Wilmarth, Noblesville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 12, 1980, Ser. No. 148,088

Int. Cl.³ H04N *9/29*

U.S. Cl. 315—8 **13 Claims**

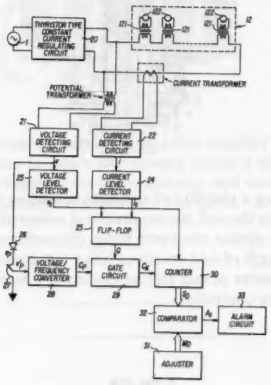


1. A degaussing arrangement, comprising:
a source of alternating polarity voltage;
a power supply coupled to said source for developing a supply voltage from said alternating polarity voltage;
a deflection generator coupled to said power supply and being energized by said supply voltage to develop a deflection rate voltage;
a transformer including first and second windings, said deflection rate voltage being applied to said first winding;
a degaussing winding; and
a relay including a coil coupled to said transformer second winding and subject to energization in response to application of said deflection rate voltage to said first winding and including switching means actuated by said coil energization for coupling said degaussing winding to said source of alternating polarity voltage to permit the flow of degaussing current.

4,295,079
LAMP CIRCUIT WITH DISCONNECTED LAMP DETECTING DEVICE

Kenichi Otsuka, Kodaira, and Yorio Hosokawa, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 25, 1980, Ser. No. 133,935
Claims priority, application Japan, Apr. 19, 1979, 54/47194
Int. Cl.³ H05B *37/03*
U.S. Cl. 315—130 **14 Claims**



1. A lamp circuit comprising:

a constant-current type AC power source;

a plurality of isolation transformers connected in series with the AC power source, each isolation transformer being coupled to an electric lamp;

means for detecting the rise of the output voltage waveform of the AC power source which exceeds a positive predetermined value which is sufficiently small with respect to the maximum level of the voltage signal and which is larger than a possible circuit induced noise level;

means for detecting the rise of the output current waveform of the AC power source which exceeds a positive predetermined value which is sufficiently small with respect to the maximum value of the current signal and which is larger than a possible circuit induced noise level;

means for performing a calculation utilizing as an input the output of said voltage detecting means and the output of said current detecting means;

means for comparing the output of said calculating means with a predetermined calculated value;

whereby the failure of at least one of said electric lamps coupled to said plurality of isolation transformers is detected.

4,295,080
SYSTEM FOR CONTROLLING ROTATIONAL DIRECTION SWITCHOVER AND FOR VARIABLY CONTROLLING ROTATIONAL SPEED OF MOTOR

Mitsuo Fujita, and Koji Matsumura, both of Yokohama, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 15, 1979, Ser. No. 94,437
Claims priority, application Japan, Nov. 15, 1978, 53-139850
Int. Cl.³ H02P *5/06*
U.S. Cl. 318—257 **5 Claims**

1. A system for controlling a switchover of rotational directions and for variably controlling the rotational speed of a motor, said system comprising:

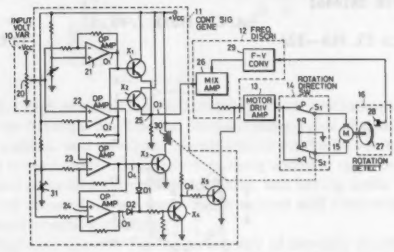
a motor capable of rotating in both a normal direction and a reverse direction;

means for switching over the rotational direction of said motor;

means for supplying a driving voltage to said motor, said motor rotating at a speed which depends upon the driving voltage;

a single voltage varying means for continuously varying a voltage; and

control signal generating means responsive to a variable voltage from said voltage varying means for generating a rotational control signal and a motor rotation stop signal for controlling said driving voltage supplying means and further for generating a rotational direction switchover

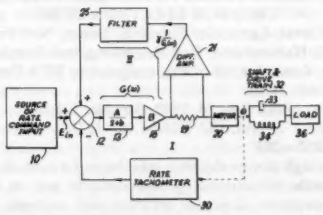


control signal for controlling said switchover means, the voltage of said rotation control signal produced by said control signal generating means decreasing as the variable voltage approaches a predetermined value, said rotation control signal reaching a minimum when the variable voltage coincides with the predetermined value, and increasing as the variable voltage goes beyond the predetermined value, the motor rotation stop signal being generated when the variable voltage decreases and reaches substantially the predetermined voltage, and the rotational direction switchover control signal being produced by said control signal generating means when the variable voltage is substantially at said predetermined voltage.

4,295,081
LOAD ACTUATING SERVOMECHANISM WITH RESONANCE EQUALIZATION

William J. Bigley, Jr., Scotch Plains, and Vincent J. Rizzo, Basking Ridge, both of N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Jan. 6, 1978, Ser. No. 866,394
Int. Cl.³ H02P *5/00*
U.S. Cl. 318—327 **6 Claims**



1. In combination in servomechanism apparatus for driving a load via coupling means characterized by a mechanical resonance at rates exceeding said resonance, summing means having first and second additive input ports, a subtractive input port and an output, a motor, a load, coupling means characterized by a mechanical resonance connecting said motor and said load, first network means connecting said output of said summing means and said motor, first negative feedback means

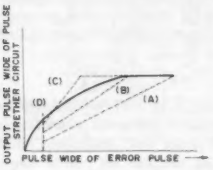
having an output connected to said subtractive input port of said summing means and an input responsive to said motor, monitoring means for monitoring the current consumed by said motor, and positive feedback network means having an input connected to said current monitoring means and an output connected to said first additive input port of said summing means for increasing the energization applied to said motor when said monitoring means senses an increasing current consumed by said motor to thereby overcome said mechanical resonance of said coupling means.

4,295,082

PULSE WIDTH MODULATED SERVO CIRCUIT

Masato Moto, and Seigo Ito, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Mar. 6, 1980, Ser. No. 127,744
Claims priority, application Japan, Mar. 9, 1979, 54-26767
Int. Cl.³ G05B *11/28*
U.S. Cl. 318—599 **3 Claims**



1. A motor servo circuit comprising:
a first pulse generator for generating pulses having a pulse width adjusted by external signals and synchronized with input pulses;
a pulse width comparator for comparing output pulses from the first generator with the pulse width of the input pulses and generating pulses having a pulse width corresponding to a difference in the pulse width of both of these pulses when the pulse widths are different;
a pulse width stretcher for stretching an output of the pulse width comparator;
a second pulse generator for generating pulses having a predetermined pulse width at intervals of the generation of predetermined number of the output pulses of the pulse width comparator;
an adder for performing an OR of the output pulses of the pulse width stretcher and the second pulse generator; and
a motor driven by the output of the adder for adjusting the output pulse width of the first pulse generator in accordance with the rotation angle of the motor.

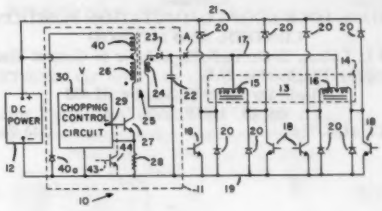
4,295,083

PULSED ENERGY STEPPING MOTOR POWER CONTROL UNIT

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Jul. 2, 1979, Ser. No. 54,311
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **26 Claims**

1. A power control unit for supplying power to a winding of a stepping motor, comprising a source of D.C. power, a capacitor, step-switching means for connecting the motor winding intermittently across the capacitor at a variable frequency that determines the motor's speed, thereby causing the capacitor to energize said winding as determined by the capacitor's charge and voltage and the impedance of said winding at the step-switching frequency, and means operable at a frequency independent of the frequency of said step-switching means for receiving pulses of energy up to a maximum amount of energy in each pulse from said D.C. source and for supplying pulses to said capacitor, said receiving and supplying means being responsive to the voltage of the capacitor to deliver to the capacitor amounts of pulse energy varying as a direct function of the capacitor voltage at least up to a predetermined frequency of said step-switching means.

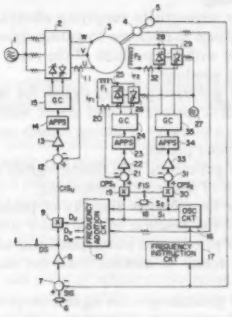


4,295,084

CONTROL APPARATUS OF SYNCHRONOUS MOTOR HAVING THYRISTOR CONVERTER

Hiroshi Nagase, Hitachi; Toshiaki Okuyama, Tokaimura; Yuzuru Kubota, Hitachi, and Katsunori Suzuki, Takahagi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 5, 1979, Ser. No. 45,849
Claims priority, application Japan, Jun. 5, 1978, 53-66701
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—719 **8 Claims**



1. A control apparatus of a synchronous motor having armature windings and perpendicular field windings, and a rotating shaft comprising: a frequency converter composed of thyristors to convert the frequency of an alternating current to supply the converted current to the armature windings of the synchronous motor; means for detecting the actual speed of the synchronous motor; means for detecting a position of the armature relative to the field; means for generating a speed instruction signal; means for rotationally exciting the field windings with alternating current; means for controlling the direction of the rotating magnetic field generated by the field windings which are excited with the alternating current, wherein the direction of the rotating magnetic field is controlled in accordance with the rotating direction of the rotary shaft of the synchronous motor as determined from the output of said actual speed detecting means; and means for controlling said frequency converter to regulate the amplitude of the converted current fed to the armature windings in accordance with a value proportional to a deviation between the speed instruction signal and the output of said speed detecting means and to regulate the frequency of the converted current in accordance with a sum of the output frequency of said position

detecting means and the frequency of the alternating current to the field windings.

4,295,085

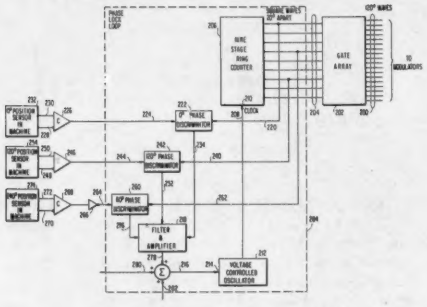
PHASE LOCK LOOP COMMUTATION POSITION CONTROL AND METHOD

David L. Lafuze, Endicott, N.Y., assignor to General Electric Company, Binghamton, N.Y.

Filed May 25, 1979, Ser. No. 42,432

Int. Cl.³ H02P *5/28, 7/36*

U.S. Cl. 318—721 **43 Claims**



1. A drive system for a multiphase DC field motor having a rotor and a stator windings for each machine phase, said drive system comprising:

(a) means for sequentially supplying electric power to said stator windings in response to gating signals generated in accordance with the position of the rotor with respect to such stator windings;

(b) means for generating gating signals for sequentially supplying electric power to said stator windings in accordance with a plurality of timing signals equal to the number of machine phases;

(c) means for generating said timing signals as a function of the position of said rotor comprising;

(d) means for furnishing a plurality of position signals as a function of the position of said rotor with respect to a plurality of preselected stator positions, said position signals being lesser in number than the number of stator windings;

(e) means for generating error signals proportional to phase difference between preselected ones of said timing signals and said positions signals;

(f) means for producing clocking signals as a function of said error signals;

(g) means for supplying said clocking signal to said means for generating timing signals;

(h) means for deriving additional timing signals representative of intermediate rotor positions from said clocking signals.

4,295,086

METHOD AND APPARATUS FOR DYNAMIC BRAKING IN A MOTOR CONTROL SYSTEM

John H. Cutler, Roanoke; Paul M. Espelage, and Loren H. Walker, both of Salem, all of Va., assignors to General Electric Company, Salem, Va.

Filed Apr. 22, 1980, Ser. No. 142,696

Int. Cl.³ H02P *3/22*

U.S. Cl. 318—759 **24 Claims**

1. In a control for an alternating current electric motor having a stator and a rotor spaced from the stator by a gap across which motor flux is produced in response to an electrical current of variable magnitude and frequency through windings associated with said stator, said control comprising:

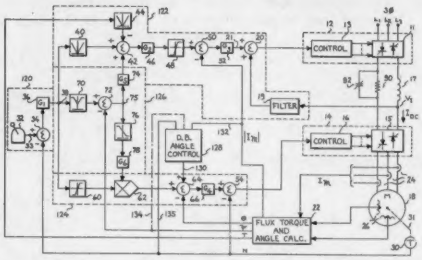
(a) a d.c. source for providing a direct current of variable magnitude;

(b) a power converter for supplying a variable frequency electrical current to said motor;

(c) a d.c. link for connecting said d.c. source to said power converter whereby said direct current of variable magnitude is supplied from said source to said converter, said d.c. link including a resistive element and switch means for selectively including and excluding said resistive element into and from said d.c. link;

(d) means to sense prescribed motor operating parameters and provide signals proportional thereto;

(e) control means for controlling said power converter to thereby control the frequency of said electrical current



supplied to said motor as a function of motor operating parameters;

(f) means to provide a braking signal designating a dynamic braking action of said motor; and,

(g) means responsive to said braking signal to:

(1) short circuit said d.c. source,

(2) render ineffective normal control of said control means,

(3) effect a braking control signal to said control means to thereby control the frequency of the electrical current supplied to said motor at a value determined by the value of a designated operating parameter, and

(4) subsequently, operating said switch means to thereby include said resistive element in said d.c. link.

4,295,087

CHARGE INDICATOR CIRCUIT FOR A BATTERY CHARGING SYSTEM

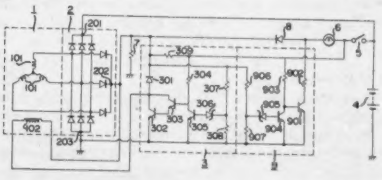
Mitsuharu Morishita, and Yoshiyuki Iwaki, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1980, Ser. No. 151,734

Claims priority, application Japan, Jun. 12, 1979, 54/80275[U]

Int. Cl.³ H02J *7/14, 7/24*

U.S. Cl. 322—99 **1 Claim**



1. In a battery charging system comprising an alternating current generator having a field winding and an output winding, full-wave rectifier means rectifying an alternating current output of said output winding and having first and second rectified output terminals and a grounded terminal, a battery

connected to said first rectified output terminal of said rectifier means to be charged therefrom, a resistor connected between said second rectified output terminal and said grounded terminal of said rectifier means, and voltage regulator means connected serially with said field winding for regulating an output voltage of said generator to a first predetermined level by conducting and cutting off a current flowing through said field winding of said generator, said field winding of said generator being supplied from an output from the second rectified output terminal of said rectifier means through said voltage regulator;

a charge indicator circuit comprising a serial connection of a diode and a charge indicator lamp connected between said second rectified output terminal and said battery through a key switch, said diode having an anode and a cathode connected to said indicator lamp and said second rectified output terminal respectively, a detector and switching network including detecting means for detecting the output voltage of said second output terminal, and switching means which is connected between said anode of said diode and a ground terminal and is turned on by said detecting means to become conductive to energize said indicator lamp when said detecting means detects that the output voltage of said second output terminal becomes less than a second predetermined level which is lower than said predetermined level by a predetermined amount.

4,295,088

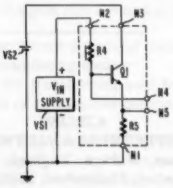
TEMPERATURE-SENSITIVE VOLTAGE DIVIDER

Max E. Malchow, Raritan Township, Somerset County, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 968,443, Dec. 11, 1978. This application Jan. 18, 1980, Ser. No. 113,372

Int. Cl.³ G05F *3/20*

U.S. Cl. 323—313 **6 Claims**



1. A voltage divider comprising:

a first terminal for receiving a reference voltage;

a second teminal for receiving a voltage to be divided;

a third terminal, between which and each of said first and second terminals respective divided voltages are available;

a fourth terminal for receiving an operating voltage;

a first transistor with a collector region, with a base region formed by a first diffusion into its collector region, followed by a second diffusion thereinto, with an emitter region formed by said second diffusicn with a collector electrode contacting its collector region ohmically and connecting to said fourth terminal, with a base electrode contacting its base region ohmically, and with an emitter electrode contacting its emitter ohmically, one of its base and emitter electrodes connecting to said third terminal;

a first resistor with a body formed by said first diffusion process in a body of semiconductive material formed by the same process as the collector region of said first transistor, with a first electrode contacting its body ohmically and connecting to said first terminal, and with a second electrode contacting its body ohmically at a different point than its first electrode does and connecting to the emitter electrode of said first transistor; and

a second resistor with a body formed by said first diffusion process in a body of semiconductor material formed by the same process as the collector region of said first transistor, and its body further formed by said second diffusion process, with a first electrode contacting its body ohmically and connecting to said second terminal, and with a second electrode contacting its body ohmically at a different point than its first electrode does and connecting to the base electrode of said first transistor.

4,295,089

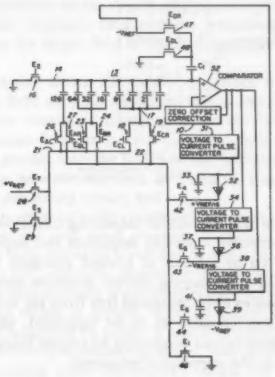
METHODS OF AND APPARATUS FOR GENERATING REFERENCE VOLTAGES

Michael Cooperman, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jun. 12, 1980, Ser. No. 158,672

Int. Cl.³ H02J *1/00*; H03K *13/02*

U.S. Cl. 323—351 **32 Claims**



1. In a system utilizing a reference voltage V, a method for providing a precise reference voltage xV comprising the steps of

(a) applying said reference voltage V to one side of a first capacitor while the opposite side of said first capacitor is coupled to a point of reference potential;

(b) with said opposite side of said first capacitor coupled to an input terminal of a comparator, decoupling said opposite side of said first capacitor from said point of reference potential, permitting said opposite side to "float";

(c) applying said point of reference potential to said one side of said first capacitor while said opposite side of said first capacitor remains coupled to said input terminal of said comparator; converting an output of said comparator to a nominal reference voltage xV; applying said nominal reference voltage xV to one side of a second capacitor while the opposite side of said second capacitor is coupled to said input terminal of said comparator; and

(d) coupling all sides of said capacitors to said point of reference potential; and cyclically repeating the foregoing steps, wherein the ratio of the value of said first capacitor to the value of said second capacitor is x.

4,295,090

ELECTRONIC SELECTOR SWITCH PARTICULARLY FOR USE IN RADIOSCONDES

Jorma Ponkala, Helsinki, Finland, assignor to Vaisala Oy, Finland

Continuation of Ser. No. 950,546, Oct. 12, 1978. This application Dec. 4, 1979, Ser. No. 100,199

Claims priority, application Finland, Oct. 14, 1977, 773064

Int. Cl.³ G01R *27/26, 19/26*

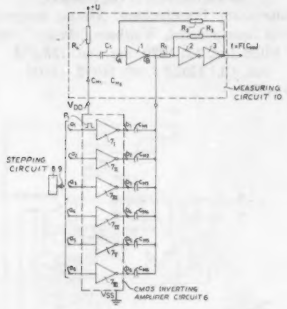
U.S. Cl. 324—60 CD **7 Claims**

1. An electronic selector switch for telemetrical use in measuring a plurality of impedances to be measured, said selector switch comprising

an impedance measuring circuit;

a plurality of CMOS inverting amplifiers each having an input and an output, the output of each of said amplifiers being connected to a corresponding one of the impedances to be measured; and

a stepping circuit connected to the inputs of said amplifiers for connecting a selected one of said inverting amplifiers and the corresponding one of said impedances to be measured in said impedance measuring circuit and connecting the remaining inverting amplifiers and impedances to be measured to a point at ground potential whereby said impedance measuring circuit measures said one of said impedances to be measured free from the influence of said remaining impedances to be measured, said impedance measuring circuit producing an output frequency proportional to the impedance measured.



4,295,091

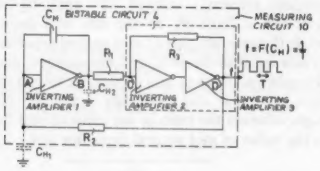
CIRCUIT FOR MEASURING LOW CAPACITANCES

Jorma Ponkala, Helsinki, Finland, assignor to Vaisala Oy, Finland

Continuation of Ser. No. 950,547, Oct. 12, 1978. This application Dec. 4, 1979, Ser. No. 100,200

Int. Cl.³ G01R *27/26, 19/26*

U.S. Cl. 324—60 CD **6 Claims**



1. A circuit for measuring low capacitances with the elimination of the influence of stray capacitances, said circuit comprising

an inverting amplifier having an input and an output;

a capacitance to be measured connected between the input and the output of the inverting amplifier;

a bistable circuit having an input connected to the output of said inverting amplifier, an output and an output frequency inversely proportional to the capacitance to be measured; and

a resistive feedback connected from the output of the bistable circuit to the input of the inverting amplifier.

4,295,092

APPARATUS FOR AND METHOD OF DETECTING AND MEASURING CORROSION DAMAGE IN PIPE

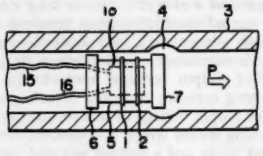
Okiyoshi Okamura, Mitaka, Japan, assignor to Koa Oil Company, Limited, Ohte, Japan

Filed Nov. 3, 1978, Ser. No. 957,315

Claims priority, application Japan, Feb. 9, 1978, 53-13935; Feb. 9, 1978, 53-13936; Feb. 9, 1978, 53-13938

Int. Cl.³ G01R *27/26;* G01B *5/28*

U.S. Cl. 324—61 R **25 Claims**



1. Apparatus for detecting corrosion damage to electrically conductive pipe, comprising:

(a) a movable conductive ring within said pipe; and

(b) means for moving said conductive ring longitudinally of said pipe;

said conductive ring and the wall of said pipe forming the electrodes of a varying electrical capacitance means such that the capacitance of said varying capacitance means changes whenever said movable conductive ring passes a corrosion portion of the inner pipe wall; and

(c) means electrically connected to said varying capacitance means for detecting the variations in its electrical capacitance.

4,295,093

SPECTRUM ANALYSERS

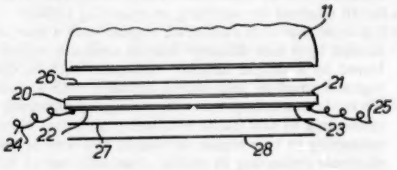
John D. Middleton, Welwyn, England, assignor to Marconi Instruments Limited, Chelmsford, England

Filed Nov. 16, 1979, Ser. No. 95,098

Claims priority, application United Kingdom, Nov. 17, 1978, 44927/78

Int. Cl.³ G01R *23/16*

U.S. Cl. 324—77 B **4 Claims**



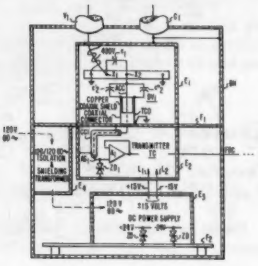
1. A spectrum analyser including a monochrome cathode ray tube utilising a raster scanning pattern in which the lines of the raster are representative of different frequency components; a liquid crystal colour switch positioned immediately in front of the screen of the cathode ray tube and containing a thin film of liquid crystal material and two coloured polarised sheets, and selection means to selectively controlling the optical properties of the film so as to produce a display consisting of at least the two colours of said polarised sheets, and means for synchronising the operation of said selection means with the raster scanning pattern of the cathode ray tube.

4,295,094

HIGH VOLTAGE HIGH FREQUENCY ANALOG SIGNAL MEASURING SYSTEM

Victor F. Wilreker, and William H. Smith, both of Greensburg, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1979, Ser. No. 34,308
Int. Cl.[3] G01R *19/26, 15/04*
U.S. Cl. 324—96 11 Claims



1. In a system for deriving a representation as a function of time of high frequency high voltage transients appearing on a high voltage power line, the combination of:

voltage divider means coupled to said power line at a point of measurement for deriving at low voltage at a first location a first analog signal representing said transients;

a first metallic enclosure surrounding said first location and connected to ground potential;

frequency modulation means disposed at a second location in close proximity to said first location and responsive to said first analog signal for frequency modulating said first analog signal and for converting the resulting frequency-encoded electrical signal into a frequency-encoded optical signal;

a second metallic enclosure at ground potential surrounding said frequency modulating means;

fiber optic means for transmitting said frequency-encoded optical signal out of said second enclosure onto a remote location; and

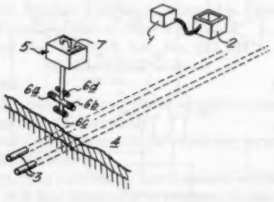
means at said remote location for converting said frequency-encoded optical signal into a second analog signal representative of said first analog signal.

4,295,095

APPARATUS AND METHOD FOR DETECTING THE LOCATION OF METALLIC OBJECTS HAVING ALTERNATING CURRENT PASSING THERETHROUGH

Richard C. Thomas, Cramlington; Stewart M. Pegler, Wideopen, and Paul B. Cordes, North Shields, all of England, assignors to British Gas Corporation, London, England

Filed Mar. 20, 1979, Ser. No. 22,100
Claims priority, application United Kingdom, Jan. 29, 1979, 03083/79
Int. Cl.[3] G01V *3/11, 3/165*
U.S. Cl. 324—326 16 Claims



1. Detector means for locating an elongated metallic object through which an alternating electrical current is passing, thereby producing an alternating magnetic field therearound, said detector means including

first, second and third magnetic field strength measuring means, said first and second magnetic field strength measuring means being positioned in a common plane which is perpendicular to a plane passing through the third magnetic field strength measuring means and said first and second magnetic field strength measuring means being equidistant from said plane passing through said third magnetic field strength measuring means and on opposite sides thereof,

first comparator means electrically connected to said first and second magnetic field strength measuring means to determine when the magnitudes of the field strengths measured thereby are equal,

second comparator means electrically connected to said first and second magnetic field strength measuring means to determine the larger field strength measurement therebetween,

third comparator means electrically connected to said third magnetic field strength measuring means and said second comparator means to determine when the field strength measurement from said third magnetic field measuring means is greater than the larger of the field strength measurements between the first and second magnetic field strength measuring means, and

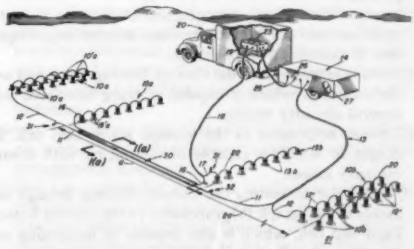
indicator means electrically connected to said first comparator means and said third comparator means to indicate when the field strengths measured by the first and second magnetic field strength measuring means are equal and when the field strength of the third magnetic field strength measuring means is greater than the larger of the field strengths measured by either of said first and second magnetic field strength measuring means, said indicator means thus indicating when the detector means has been positioned such that the plane passing through said third magnetic field strength measuring means is coincident with a plane in which the elongated metallic object is located.

4,295,096

ELECTRODE PROSPECTING METHOD PROVIDING CALCULABLE ELECTROMAGNETIC COUPLING FOR THE INDIRECT DETECTION OF HYDROCARBON RESERVOIRS

Ben K. Sternberg; Dale E. Miller, and Dhari S. Bahjat, all of Ponca City, Okla., assignors to Conoco, Inc., Ponca City, Okla.

Filed Dec. 20, 1978, Ser. No. 971,177
Int. Cl.[3] G01V *3/06*
U.S. Cl. 324—357 11 Claims



9. A method of electrical hydrocarbon prospecting to investigate a subsurface polarizable stratum which is indicative of the presence of a hydrocarbon deposit lower than the stratum wherein a first set of spaced electrode means is placed in the surface of the ground in electrical communication with said stratum, a second set of spaced electrode means is placed in the

surface of the ground in electrical communication with said stratum, with generating means coupled through second conductor means to said second set of electrode means, and a voltage measuring means coupled through a first conductor means to said first set of spaced electrode means, an improvement comprising:

(a) maintaining a calculable electromagnetic coupling between said first and second conductor means;

(b) measuring the current through said second conductor means to said second set of spaced electrical means; and

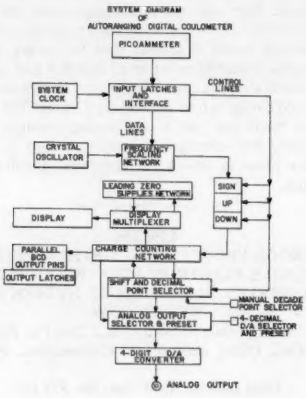
(c) recording in time synchronism voltage that is measured through said first conductor means from said first set of spaced electrical means by said voltage measuring means, and said measured current, whereby an anomaly indication of a hydrocarbon deposit can be ascertained by processing from the measured current and voltage and said calculable electro-magnetic coupling.

4,295,097

BATTERY CAPACITY MEASURING METHOD AND APPARATUS

Arthur H. Thompson, 14 Princeton Dr., New Providence, N.J. 07974, and Ricardo H. Ballester, Jamaica Estates, N.Y., assignors to Arthur H. Thompson, New Providence, N.J.

Filed May 7, 1979, Ser. No. 36,412
Int. Cl.³ H02J *7/00*
U.S. Cl. 324—429 **16 Claims**



1. A device for automatically testing an electrochemical cell, comprising:

(a) means for selectively charging and discharging current to and from said cell in predetermined discrete steps responsive to control circuitry means;

(b) means responsive to the current flowing from said cell, the output of which is capable of being interfaced with control circuitry means;

(c) means responsive to the voltage across said cell, the output of which is capable of interfacing with control circuitry means;

(d) means for measuring the current flowing through said means of paragraph (b) responsive to the current flowing from said cell, which is also capable of integrating said current and is further capable of being interfaced with control circuitry means;

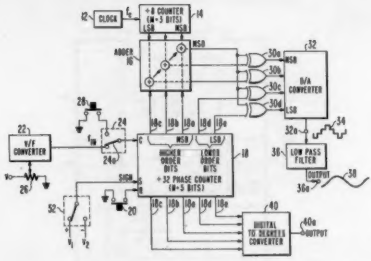
(e) control circuitry means coupled to said means of a paragraph (a), whereby said control circuitry means selectively controls the state of charge or discharge of current to and from said cell in response to said means of paragraph (c).

4,295,098

DIGITALLY ADJUSTABLE PHASE SHIFTING CIRCUIT

Albert T. Crowley, Gloucester Township, Camden County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,122
Int. Cl.³ H03L *7/18;* **H03K** *13/02, 4/02, 3/017*
U.S. Cl. 328—24 **6 Claims**



1. Apparatus for producing an alternating signal with a controllable phase shift, comprising in combination:

means producing a periodic signal having a given period;

divider means responsive to said periodic signal for producing a first digital signal changing as a function of said given period and manifested as a plurality of M bits;

means for storing a value indicative of the phase of said alternating signal and for producing, in accordance with said value, a second digital signal manifested as a plurality of N bits comprising M higher order bits and N-M lower order bits and having a control terminal receptive of a control signal for changing said value, where, $N \geqq M$;

means responsive to said first digital signal and second digital signal for adding ones of said M bits of said first digital signal with corresponding ones of said higher orders bits of said N bits to produce a most significant bit (MSB) and lower order bits;

means responsive to said added bits and lower order ones of said N bits for producing an analog alternating signal corresponding to the value of said added and lower order bits; and

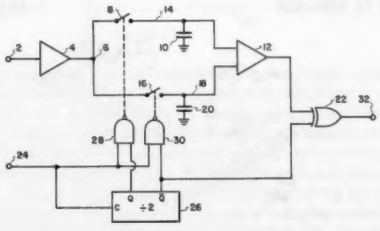
means coupled to said means for storing a value for producing a control signal to change said stored value to thereby change the phase of said alternating signal.

4,295,099

PEAK DETECTOR

Thomas E. Evans, Parker, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 5, 1979, Ser. No. 72,572
Int. Cl.³ H03K *5/153*
U.S. Cl. 328—151 **8 Claims**



1. A peak detector circuit comprising:

input signal terminal means for connection to a source of analog signals,

a first and second sample holding means,

means connected to said input terminal means for applying successive samples of said analog signals to said first and second holding means alternately,

comparator means connected to compare the magnitude of said signals stored in said holding means to produce a phase change signal on the occurrence of a peak value of said analog signal, and

means connected to be responsive to said phase change signal from said comparator means to produce an output signal indicative of the occurrence of said peak value.

4,295,100

MICROPHONE AMPLIFIER, IN PARTICULAR FOR TELEPHONE SYSTEMS

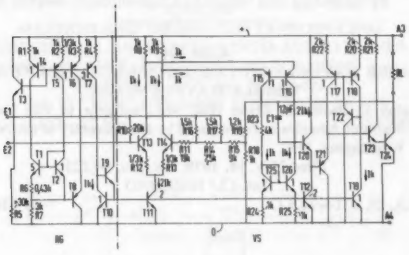
Horst Kraemer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 1, 1979, Ser. No. 90,468

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1978, 2850792

Int. Cl.³ H03F *3/45, 3/68*

U.S. Cl. 330—257 **8 Claims**



1. In a microphone amplifier of the type providing common terminals on which an output signal is superimposed on its feed current, in which an input stage comprises an emitter resistance stabilized differential amplifier, an output stage comprising a two-transistor Darlington amplifier operating as a controlled voltage source, a negative feedback circuit connects the output and input stages, and a reference voltage source is connected to stabilize the operating point of the differential amplifier, the improvement therein comprising:

coupling means connecting the differential amplifier to the Darlington amplifier, including a symmetrically connected transistor coupling stage and a two-stage intermediate amplifier; and

current mirror circuits connected to said coupling stage and to the input stage for providing current symmetry therein.

4,295,101

CLASS AB PUSH-PULL QUASI-LINEAR AMPLIFIERS

Arthur J. Leidich, Raritan Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1979, Ser. No. 102,131

Int. Cl.³ H03F *3/26*

U.S. Cl. 330—262 **13 Claims**

1. A Class AB push-pull quasi-linear amplifier comprising:

input and output signal terminals;

first and second supply terminals for receiving an energizing potential therebetween;

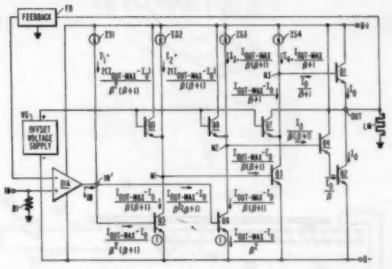
a first plurality, N in number, of transistors of a first conductivity type in a first sequential arrangement, each transistor having a respective base electrode, each having respective emitter and collector electrodes defining the ends of a respective principal current conduction path the conductivity of which is controlled by current applied to the base electrode of that transistor, and each exhibiting a current gain between its base electrode and one of its emitter and collector electrodes appreciably greater than unity;

a second plurality, N in number, of transistors of said first conductivity type in a second sequential arrangement, each transistor having a respective base electrode, each having respective emitter and collector electrodes defining the ends of a respective principal current conduction path the conductivity of which is controlled by current applied to the base electrode of that transistor, and each exhibiting a current gain between its base electrode and one of its emitter and collector electrodes substantially corresponding to said current gain exhibited by a respective one of the transistors in said first plurality, with which it is paired;

means for connecting said first plurality of transistors, in order of said first sequential arrangement, in a first direct-coupled cascade amplifier with a current gain that is substantially equal to the product of the current gains of said first plurality of transistors, including

means connecting said input signal terminal to the base electrode of the first transistor in said first sequential arrangement including

means connecting the principal conduction path of each transistor except the last in said first sequential arrangement to control the current flowing to the base elecrode of the following transistor in said first sequential arrangement, and including



a connection of the emitter electrode of the last transistor in said first sequential arrangement to said first supply terminal and

a connection of its collector electrode to said output signal terminal;

means for connecting said second plurality of transistors, in order of said second sequential arrangement, in a second direct-coupled cascade amplifier with a current gain that is substantially equal to the product of the current gains of said second plurality of transistors and that is opposite in sense to that of said first direct-coupled cascade amplifier, including

means connecting said input signal terminal to the base electrode to the first transistor in said second sequential arrangement, including

means connecting the principal conduction path of each transistor except the last in said second sequential arrangement to control the current flowing to the base electrode of the following transistor in said second sequential arrangement, at least one current-inverting one of these transistors having its collector electrode connected to the base electrode of the following transistor in said second sequential arrangement, and including

a connection of the emitter electrode of the last transistor in said second sequential arrangement to said output signal terminal and

a connection of its collector electrode to said second supply terminal; and

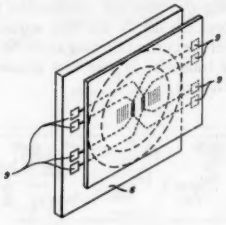
respective constant current generator means connected to the base electrode of each transistor in said first and second sequential arrangements which has connected to it the collector electrode of a preceding current-inverting transistor.

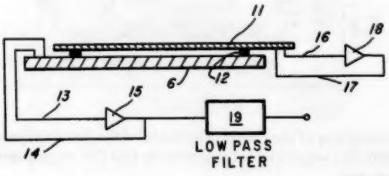
4,295,102

SURFACE ACOUSTIC WAVE SENSOR SENSING CIRCUITS

Gary D. Schmidt; Jerry L. Norris, and Donald F. Weirauch, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1979, Ser. No. 80,366
Int. Cl.³ G01B *7/16;* H03B *5/18;* H03H *9/25*
U.S. Cl. 331—65 **8 Claims**





5. A strain sensing system comprising:

a first substrate having a surface acoustic wave array located thereon, and an amplifier coupled to said array to form a first oscillator circuit;

second substrate having a surface acoustic wave array located thereon, and an amplifier coupled to said array to form a second oscillator circuit;

means for physically locating said first substrate and said second substrate in proximity to each other such that a capacitive coupling is created between said SAW arrays for mixing the frequencies generated by said oscillator circuits, and for changing said capacitive coupling when either of said substrates is recipient of strain which alters the proximity of said SAW arrays;

circuit means for development of frequency difference of said oscillator circuits, in at least one of said oscillator circuits;

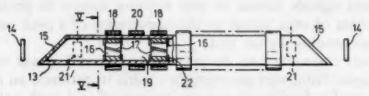
filter means for passage of said frequency difference only, coupled to said circuit means for development of frequency difference.

4,295,103

METAL VAPOR LASER

Ariold Ljudmirsky, 8L/26 Ramot, Jerusalem, Israel

Filed Mar. 23, 1978, Ser. No. 889,396
Int. Cl.³ H01S *3/097*
U.S. Cl. 331—94.5 PE **33 Claims**



1. A method of stimulating the emission of light in a laser, comprising the steps of:

disposing a plurality of solid electrically conductive bodies, each consisting at least in part of a vaporizable substance whose vapors are excitable to a radiation-emissive level, at spaced-apart sites in a substantially closed vessel of dielectric material;

simultaneously generating an electric current pulse by electromagnetic induction through the wall of said vessel in each of said bodies for vaporizing at least part of said substance; and

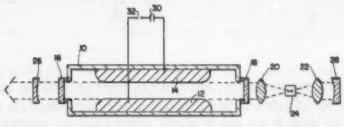
exciting the resulting vapors to the radiation-emissive level by subjecting said vapors to a high-intensity electric field.

4,295,104

LASER HAVING SIMULTANEOUS ULTRAVIOLET AND VISIBLE WAVELENGTHS

Ralph L. Burnham, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 14, 1979, Ser. No. 94,125
Int. Cl.³ H01S *3/05*
U.S. Cl. 331—94.5 C **14 Claims**



1. A laser system operative in the visible region of the spectrum which comprises:

a first and second laser having a common optical cavity;

said first laser including a medium which possesses a high-gain UV transition and a low-gain visible transition disposed within a resonant second optical cavity;

said second laser including a high gain medium which is stimulated by UV radiation; and

said first laser further including means for extracting and directing the ultraviolet radiation from said second optical cavity into the high gain medium of said second laser;

whereby the stimulated emission of said second laser is amplified by the low-gain visible transition of said first laser to produce laser emission in the visible region of the spectrum in the common optical cavity.

4,295,105

SWITCHED-CAPACITOR MODULATOR

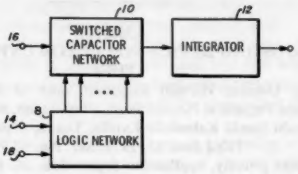
John A. C. Bingham, Palo Alto, Calif., assignor to Racal-Vadic, Inc., Sunnyvale, Calif.

Filed Feb. 7, 1980, Ser. No. 119,374
Int. Cl.³ H03C *1/02;* H03K *7/00*
U.S. Cl. 332—9 R **8 Claims**

1. A switched-capacitor modulator for modulating a carrier signal with a modulating signal to develop a modulated signal, said modulator comprising:

switching means including, a first input terminal for applica-

tion of the modulating signal, a second input terminal for application of a plurality of switching signals, an output terminal for providing a sampled modulating signal, a primary capacitive means having first and second plates, and a plurality of binary switches responsive to the switching signals for connecting said first and second plates to said input and output terminals;



logic means responsive to the carrier signal and a clock signal having a frequency of at least four times the frequency of said carrier signal and operative to generate said switching signals; and

integrator means responsive to said sampled modulating signal and operative to provide the modulated signal.

4,295,106

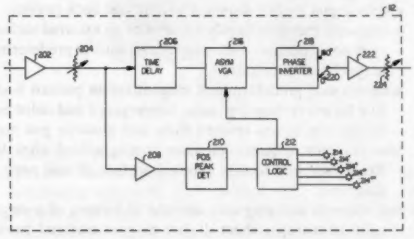
METHOD AND MEANS FOR INTRODUCING ADDITIONAL ASYMMETRY INTO AUDIO WAVES

Leonard Kahn, 137 E. 36 St., New York, N.Y. 10016

Filed Oct. 4, 1979, Ser. No. 81,631

Int. Cl.³ H03C *1/00;* H03G *11/00;* H03K *5/153*

U.S. Cl. 332—37 R **16 Claims**



1. Audio signal modulation equipment comprising an audio signal source, carrier wave generation means, and means for modulating carrier waves with the audio signal, the improvement which comprises;

means for converting an audio signal, having little or no asymmetry, to a wave having substantial asymmetry through which an audio signal from said audio signal source is passed and fed to the carrier wave modulating means,

said converting means, comprising a peak detector which detects the signal having the proper polarity to cause positive going envelope modulation, and,

means controlled by the peak detector for providing greater transmission for portions of the audio wave that produce positive going envelope modulation than portions of the audio wave that produce negative going modulation during periods when the peak detector provides an output above a predetermined level.

9. A detector for detecting the peak voltage of a wave comprising;

(a) a first rectification means with its input terminal coupled to the signal having the proper polarity to cause positive going envelope modulation,

(b) one or more additional rectification means,

(c) one or more time delay means through which at least a sample of said proper polarity signal is passed and if a plurality of delay means are provided said delay means connected so as to provide a total delay equal to the sum of the delays of the individual delay means,

(d) means for connecting the input terminals of the one or more rectification means (b) to the one or more output terminals of delay means (c),

(e) combining means connected to the output terminals of the rectification means (a) and rectification means (b), said combining means incorporating storage means having a capacity sufficient to maintain the level of the detected wave within a predetermined droop tolerance for a period of time equal to approximately T/D+T where T is the period of one complete alternation of the lowest frequency component of substantial level expected in the wave being detected and D is the number of time delay means (c).

11. A device for converting a substantially symmetrical wave into one substantially asymmetrical comprising;

means for splitting said wave into its positive and negative polarity segments,

two separate paths at least for some portion of the path to an associated transmitter's modulator for passing the two segments, said separate paths having different transmission characteristics both of which are essentially linear, but the path for the segment that causes positive going modulation being of higher transmission gain.

4,295,107

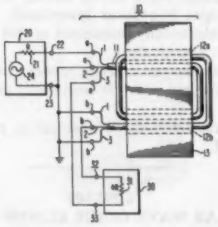
IMPEDANCE TRANSFORMATION NETWORK

Stewart M. Perlow, Marlboro, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1980, Ser. No. 117,238

Int. Cl.³ H03H *7/38, 7/42*

U.S. Cl. 333—25 **12 Claims**



1. Apparatus comprising:

first circuit for processing RF signals in a predetermined frequency range having a signal connection point and a signal reference point for signals developed at said signal connecting point of said first circuit;

a second circuit for processing RF signals in said predetermined frequency range having first and second signal connection points and a signal reference point for signals developed at said first and second signal connection points of said second circuit;

a trifilar wire configuration having three conductors substantially equally spaced with respect to one another throughout a predetermined length of said wire configuration between first and second ends, said predetermined length being substantially shorter than the wavelength of the highest frequency signal in said predetermined range, each of said conductors having first and second ends respectively connected to points respectively located at said first and second ends of said predetermined length, said first and second ends of said first conductor being connected to said signal connection and signal reference points, respectively, of said first circuit, said first end of said third conductor being connected to said first signal connection point of said second circuit, said second end of said second conductor being connected to said second signal connection point of said second circuit, and said

first end of said second conductor and said second end of said third conductor being connected to said signal reference point of said second circuit, there being no DC signal paths connected directly between said signal connection point of said first circuit and each of said first and second signal connection points of said second circuit; and

a ferrite member having a generally cylindrical shape with two apertures formed through it through which said trifilar wire configuration is wound, said apertures having lengths such that the substantial portion of said predetermined length is surrounded by ferrite material.

4,295,108

FILTER CIRCUIT EMPLOYING SURFACE ACOUSTIC WAVE DEVICE

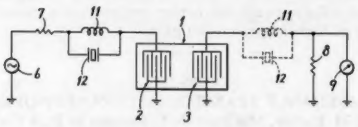
Hideharu Ieki, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 17, 1980, Ser. No. 188,226

Claims priority, application Japan, Sep. 25, 1979, 54/123343

Int. Cl.³ H03H *9/64, 9/60*

U.S. Cl. 333—193 **8 Claims**



1. A filter circuit located between an input and an output terminal, comprising:

a surface acoustic wave device having an input transducer and an output transducer acoustically coupled to each other and electrically connected to said input and output terminals, respectively;

a tuning coil connected in series between one said transducer and said terminal which is electrically connected thereto; and

a piezoelectric resonator connected in parallel with said tuning coil.

4,295,109

RECTANGULAR WAVE GUIDE ELBOW BENT ACROSS THE NARROW SIDE WITH CAPACITIVE LOADING

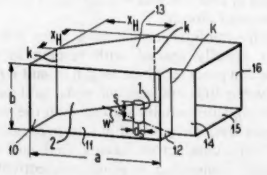
Eberhard Schuegraf, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,577

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1978, 2856733

Int. Cl.³ H01P *1/02*

U.S. Cl. 333—249 **3 Claims**



1. A rectangular wave guide H-elbow bent across the narrow side of the wave guide and having an external corner symmetrically flattened with a conductive flattening plane, characterized in that the value x_H/a of the corner flattening is selected so as to be greater than 0.73, whereby x_H is the distance from the junction of the flattening plane with the narrow side (k) to the apex of the outer bend edge of a non-flattened elbow and "a" is the length of the broad side of the wave guide; and electrically conductive means (3) functioning as a capacitive load are provided in the wave guide elbow in the area of the geometrical median (w) of the bend, in that a conductive cross-bar (3) which extends between the flattening plane (2) to the inner bend edge (K) is provided as the capacitive load electrically conductive means.

4,295,110

ADJUSTING DEVICE FOR COLOR CATHODE RAY TUBE

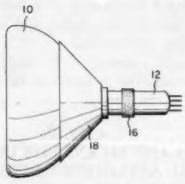
Tatsuo Uesaka; Hiroshi Sugahara, both of Amagasaki, and Takeo Fujimura, Nagaokakyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1979, Ser. No. 47,993

Claims priority, application Japan, Jun. 24, 1978, 53/76644

Int. Cl.³ H01F *1/00*

U.S. Cl. 335—212 **3 Claims**



1. An adjusting device for a color cathode ray tube comprising:

a neck portion of a color cathode ray tube;

electron gun means disposed within said neck portion;

a magnetic member fixedly secured to an external surface of said neck portion and magnetized into a predetermined magnetization pattern;

wherein said predetermined magnetization pattern is effective for correcting the static convergence and color purity of electron beams emitted from said electron gun means;

wherein said magnetic member is magnetized after being fixedly secured to said external surface of said neck portion;

and wherein said magnetic member is formed of a magnetically anisotropic sheet-shaped magnet material having a magnetic easy axis perpendicular to said external surface of said neck portion.

4,295,111

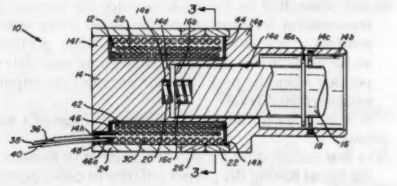
LOW TEMPERATURE LATCHING SOLENOID

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and William S. Wang, Marina del Rey, Calif.

Filed Nov. 29, 1979, Ser. No. 98,568

Int. Cl.³ H01F *3/00, 7/08*

U.S. Cl. 335—256 **12 Claims**



1. Magnetically operable apparatus capable of operating in cryogenic environment comprising:

(a) plunger means, including magnetically responsive mate-

rial, movable generally along a path between a first position and a second position;

(b) coil means generally circumscribing at least a portion of said path and positioned so that the center of said magnetically responsive material of said plunger means moves generally toward the center of said coil means as said plunger means moves toward said second position;

(c) a first coil segment, as part of said coil means, constructed of electrically conducting material; and

(d) a second coil segment, as part of said coil means, electrically connected in sequence with said first coil segment, and constructed of electrically conducting material with a temperature coefficient of resistivity lower than that of said first coil segment and

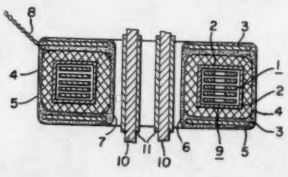
(e) the total resistance of the coil means remaining nonzero for all values of the temperature of the environment within which the apparatus is to be operated.

4,295,112

RESIDUAL CURRENT TRANSFORMER

Yoshito Yamada; Hiroshi Okumura, and Shoji Murakami, all of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1979, Ser. No. 71,360
Claims priority, application Japan, Aug. 30, 1978, 53-105930; Dec. 15, 1978, 53-155454
Int. Cl.³ H01F *15/04, 40/06*
U.S. Cl. 336—84 M **8 Claims**



1. A residual current transformer, comprising:

an annular core of magnetic material, said core including a continuous magnetic path within said core, said core including at least one portion wherein the longitudinal cross-section of said core is reduced with respect to the longitudinal cross-section of the remainder of said core;

a first annular shield of magnetic material positioned concentric with respect to said core and located in parallel with a first side thereof;

a second annular shield of magnetic material positioned concentric with respect to said core and located in parallel with a second side thereof; and

a secondary coil wound about the exterior of said annular core, said secondary coil being located between said annular core and said first and second annular shields.

4,295,113

SHEET-WOUND TRANSFORMER OR REACTOR

Anders Björklund; Erik Persson, and Lars-Göran Virsberg, all of Vesteras, Sweden, assignors to Asea Aktiebolag, Vesteras, Sweden

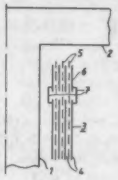
Filed Aug. 11, 1980, Ser. No. 176,911
Claims priority, application Sweden, Aug. 14, 1979, 7906765
Int. Cl.³ H01F *15/04*
U.S. Cl. 336—84 M **10 Claims**

1. A transformer or reactor comprising:

a core consisting of magnetic material and having at least one leg (1) and one yoke (2);

at least one winding (3) arranged substantially concentrically around said core leg, said winding being built up from a foil (4), spirally-wound in several turns, of a material having a high electrical conductivity and an insulating film (5) arranged between said turns;

a magnetic flux-controlling spirally-wound tape (6) of a highly permeable ferro-magnetic material being arranged axially outside each end of the winding and coaxially



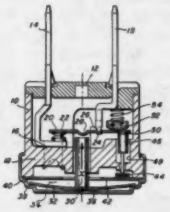
therewith, the magnetic material in the tape being divided in such a manner that the ability of the tape to carry electric current in the longitudinal direction of the tape is considerably reduced; and connections (7) being arranged between the tape and the winding at the beginning and end of the tape.

4,295,114

THERMO-SWITCH

Walter Pohl, Milan, Italy, assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 28, 1980, Ser. No. 115,977
Claims priority, application Italy, Jan. 29, 1979, 19684 A/79
Int. Cl.³ H01H *61/01*
U.S. Cl. 337—3 **6 Claims**



1. An overload protective thermostat comprising:

(a) housing means;

(b) switch means disposed within said housing means, said switch means including a switch blade member mounted on a support for movement between positions making and breaking first and second spaced sets of circuit contacts;

(c) heat responsive service actuator means disposed within said housing means, said actuator means being operative in response to experiencing a predetermined service temperature to cause movement of said switch member for breaking said first set of electrical contacts;

(d) collapsible support means maintaining said switch member in a position such that said first and second sets of contacts are normally closed; and,

(e) means biasing said switch member against said support means in a direction tending to open said second set of contacts wherein upon said thermostat experiencing temperatures above a second predetermined level greater than said service temperature, said support means collapses permitting said bias means to open said second set of contacts irrespective of the condition of said first set of contacts;

(f) a first electrical terminal, operatively connected in series circuit arrangement with said first set of contacts and adapted for connection thereto externally of said housing means; and

(g) a second electrical terminal operatively connected in

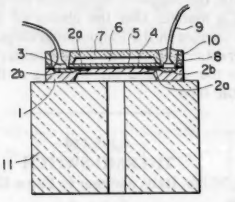
series circuit arrangement with said second set of contacts and adapted for connections thereto externally of said housing means.

4,295,115

SEMICONDUCTOR ABSOLUTE PRESSURE TRANSDUCER ASSEMBLY AND METHOD

Minoru Takahashi, Katsuta; Takahiko Tanigami, Mito; Kaoru Uchiyama, Katsuta; Hitoshi Minorikawa, Mito; Motohisa Nishihara; Kanji Kawakami, both of Katsuta; Seiko Suzuki, Hitachiota; Hiroaki Hachino, Hitachi, and Yutaka Misawa, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 4, 1979, Ser. No. 27,157
Claims priority, application Japan, Apr. 5, 1978, 53-39191
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—4 **13 Claims**



1. A semiconductor pressure transducer assembly comprising:

a silicon diaphragm assembly, on which a pressure sensitive diaphragm is formed;

piezoresistive elements diffused on the pressure sensitive diaphragm of said silicon diaphragm assembly, the resistance value of the piezoresistive elements varying depending on the strain appearing in the diaphragm;

conducting paths diffused on said silicon diaphragm assembly for electrical connection of said piezoresistive elements;

passivating layer covering the surface of said silicon diaphragm assembly, on which surface said piezoresistive elements and said conducting paths are diffused; and

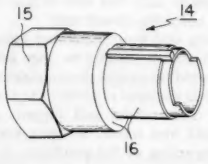
a covering member of insulating material mounted on the surface of said silicon diaphragm assembly, characterized in that a layer of conductor is disposed between said passivating layer and said covering member, and said conductor layer and said covering member are bonded by Anodic Bonding method.

4,295,116

PRESSURE TRANSDUCER

Vance D. Studlien, Stow, Mass., assignor to Bofors America, Inc., Edison, N.J.

Filed Dec. 5, 1979, Ser. No. 100,384
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—4 **16 Claims**



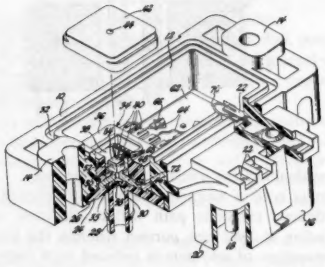
1. A fluid-pressure transducer comprising a substantially rigid single-piece body having a recess therein from an open end thereof which is closed at its bottom by a substantially flat uniform-thickness integral diaphragm, the outer side of said diaphragm being substantially coplanar with the end of a relatively thick and substantially rigid annular rim of said body about said diaphragm, said recess having pressure-fitting means near said open end for coupling said recess and the inner side of said diaphragm with a site of fluid pressures which are to be sensed, and said coplanar outer side of said diaphragm and end of said annular rim being substantially unobstructed by any portions of said body extending beyond the plane thereof, and a substantially flat foil electrical network including strain gages and relatively broad-area contact tabs and conductive paths bonded in insulated overlying relation to said coplanar outer side of said diaphragm and said end of said annular rim, said gages being disposed in overlying relation to said diaphragm and said contact tabs being disposed in overlying relation to said end of said annular rim, and means making external electrical circuit connections with said gages through said contact tabs.

4,295,117

PRESSURE SENSOR ASSEMBLY

Donald E. Lake, and John M. Hart, Jr., both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 11, 1980, Ser. No. 186,238
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—4 **3 Claims**



1. In a pressure sensor assembly, means for mounting a pressure sensor element in a housing to isolate the sensor element from stresses occurring in the housing, comprising

a hollow molded resin housing having an external opening, a flat surface surrounding the opening,

a glass base secured to the flat surface and covering the opening, the glass base and the housing having different thermal coefficients of expansion and being joined by a layer of soft resilient adhesive which inhibits stress transfer from the housing to the base, the glass base comprising a plate having an integral raised pedestal extending into the said opening whereby any stresses in the base are minimized in the pedestal due to the added rigidity in the region of the pedestal,

a glass support in the housing secured to the pedestal by a soft epoxy adhesive which inhibits the transfer of stress from the pedestal to the support, and

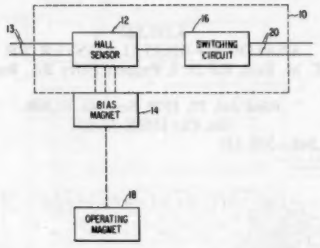
a silicon pressure sensor chip rigidly bonded to the glass support at a region spaced from the pedestal, the glass base and the glass support each having approximately the same thermal coefficient of expansion as the silicon chip,

whereby the cumulative effect of the several stress minimizing features is to isolate the silicon chip from thermal and other stresses induced in the housing or other parts of the assembly.

4,295,118
LATCHING RELAY USING HALL EFFECT DEVICE

John A. Herr, Garwood, and Bruce R. Rogan, Somerville, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed May 21, 1980, Ser. No. 152,210
Int. Cl.[3] H01L *43/04*
U.S. Cl. 338—32 H 6 Claims



1. A latching switch comprising:

a Hall effect digital switching device including a Hall sensor for generating an output voltage proportional to magnet field strength and means responsive to the output voltage generated by said Hall sensor for providing a switching function;

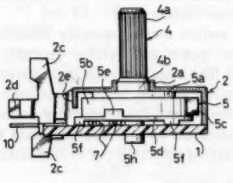
a reversible bias magnet supported with a pole thereof contiguous said Hall sensor for generating at one polarity, a first output voltage providing a switching function and at a reverse polarity a second output voltage providing a converse switching function; and,

means for reversing the polarity of said reversible bias magnet.

4,295,119
ROTARY VARIABLE RESISTOR

Masao Kasashima, and Yoshizo Kubo, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1980, Ser. No. 128,941
Claims priority, application Japan, Mar. 12, 1979, 54-31478[U]
Int. Cl.[3] H01C *10/32*
U.S. Cl. 338—162 3 Claims

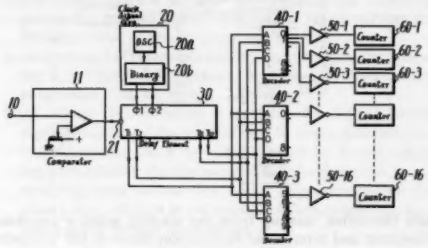


1. A rotary variable resistor having a substrate carrying a resistance element connected to terminal portions; a cover member fitting over said substrate and having an upper wall extending generally parallel thereto; and a rotor formed of a synthetic resin and carrying a conductive wiper adapted to slide across said resistance element during rotation of said rotor; said rotor having an upper shoulder adapted to bear against the inner surface of the upper wall of said cover, an elastic flange extending outwardly from the lower portion of said rotor and means including a plurality of legs extending downwardly from said flange and riding on said substrate for elastically deforming said flange upwardly to urge said upper shoulder into continous engagement with the inner surface of the upper wall of said cover.

4,295,120
PATTERN DATA PROCESSING METHOD AND APPARATUS TO PRACTICE SUCH METHOD

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Filed Aug. 27, 1979, Ser. No. 69,911
Claims priority, application Japan, Aug. 28, 1978, 53/104554
Int. Cl.[3] G06K *9/46*
U.S. Cl. 340—146.3 MA 2 Claims



1. Apparatus for processing patent data comprising:

a photo-electric conversion sensor including a screen on which a pattern to be recognized is applied said screen comprising a plurality of picture elements, said picture elements being divided into a plurality of picture element groups, each of said picture element groups comprising at least two adjacent horizontal and vertical picture elements;

comparator means for receiving an output signal from said photo-electric conversion sensor and producing white and black two value data signals;

means for delaying said white and black two value data signals; a clock signal generator means for producing a clock signal and applying said clock signal to said delay means so that said delay means delays said white and black two value signal at a speed equal to the scanning speed of said photoelectric conversion sensor to produce a delayed signal corresponding to each of said plurality of picture element groups;

a decoder means for decoding said delayed signal from said delay means; and,

means for counting a signal from said decoder means to produce data corresponding to said picture element groups.

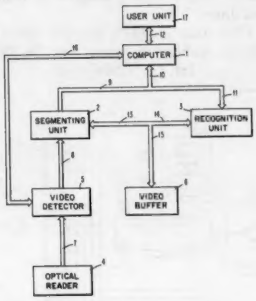
4,295,121
DEVICE FOR OPTICAL CHARACTER READING

Mats A. Enser, Vändstigen; Lars O. Hallberg, Stalvägen, and Nils G. Stalberg, Jaktstigen, all of Sweden, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1979, Ser. No. 95,832
Claims priority, application Sweden, Jan. 16, 1979, 7900362
Int. Cl.[3] G06K *9/34*
U.S. Cl. 340—146.3 MA 11 Claims

1. Device for optical character reading comprising an optical reading unit, a video detector, a segmenting unit, a video buffer, a recognition unit, a user unit and a control computer, characterized in that said control computer **1** is adapted to receive horizontal and vertical information for detecting video patterns **20**, **21**, **22**, and **28** from the segmenting unit **2** and that said controlling computer **1** further is adapted to calculate coordinates for a start point **41**, **42** for a character to be recog-

nized, whereby the computer sends coordinate values for the start point to the recognition unit 3 and that the recognition



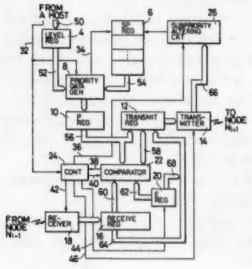
unit thereafter, starting from the starting point, recognizes a character and returns the recognition result to the computer.

4,295,122

BUS PRIORITY CONTROL METHOD IN LOOP BUS NETWORK SYSTEM

Minoru Hatada; Kunio Hiyama, both of Sagamihara; Hirokazu Ihara, Machida, and Hisao Kuma, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1979, Ser. No. 86,443
Claims priority, application Japan, Oct. 30, 1978, 53-132656
Int. Cl.[3] H04Q *9/00*
U.S. Cl. 340—147 LP **17 Claims**



1. For use in a loop bus network comprising a plurality of processors and a loop bus for connecting said processors to one another and for transmitting data in the form of messages in a predetermined direction therealong among said processors in series, a loop bus priority control method for selectively assigning the bus use to one of said processors on a priority bus, comprising

(A) transmitting priority data to said bus from one or more of said processors when message transmission on said loop is desired by said processor or processors, said priority data including both a message level and a sub-priority level, said message level designating the kind of message to be transmitted with respect to a plurality of different kinds of messages that might be transmitted and said sub-priority level indicating the priority level of the respective processor for the designated message level, the sub-priority levels assigned to said processors being different in different message levels;

(B) receiving in said processors priority data from said bus; and

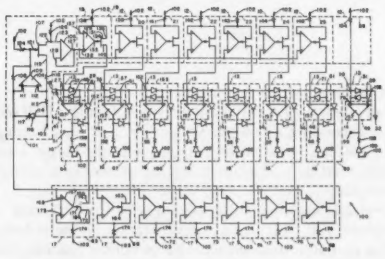
(C) enabling use of said bus by that processor whose transmitted priority data designates the highest message level without regard to sub-priority levels or designates the highest sub-priority level within the highest designated message level where the priority data transmitted by more than one processor designates the same highest message level.

4,295,123

ANALOG-TO-DIGITAL CONVERTER

Samuel C. M. Reid, R.F.D. 2, Peppers Ferry Rd., Radford, Va. 24141

Filed Jul. 27, 1979, Ser. No. 61,509
Int. Cl.[3] H03K *13/02*
U.S. Cl. 340—347 AD **16 Claims**



1. An analog to digital converter for converting an analog signal into a digital equivalent, comprising:

a first stage having:

first positive fixed current source means for providing a first positive current;

first current direction controlled voltage drop means having an input for the reception of input current and an output, for producing a voltage drop between the input and the output that varies in polarity in response to the sign of the input current, the input being operably connected to said first positive fixed current source means and to the analog signal.

first comparator means for comparing the input signal with the output signal of said first current direction controlled voltage drop means;

first negative switched current source means for providing a first negative current; and

first current switch means operably connected to said first comparator means and further operably connected between said first negative switched current source means and the output of said first current direction controlled voltage drop means, for selectively connecting said first negative switched current source means to the output of said first current direction controlled voltage drop means; and

a second stage having:

second positive fixed current source means for providing a second positive current;

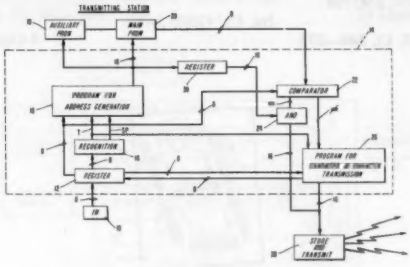
second current direction controlled voltage drop means having an input for the reception of input current and an output for producing a voltage drop between the input and the output that varies in polarity in response to the sign of the input current, the input being operably connected to said second positive fixed current sources means and to the output of said first current direction controlled voltage drop means, the output being operably connected to a ground; and

second comparator means for comparing the input signal with the output signal of said second current direction controlled voltage drop means.

4,295,124
COMMUNICATION METHOD AND SYSTEM

Philip M. Roybal, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 13, 1979, Ser. No. 66,221
Int. Cl.³ H03K *13/00*; H04L *3/00*
U.S. Cl. 340—347 DD **22 Claims**



19. A system for encoding and transmitting messages comprising words which are composed of characters coded in a code, comprising:

a register for receiving entry of a word to be encoded and transmitted, said entry being coded character by character in said code,

a code generation means for generating from the word entered in said register an address,

a memory having addresses and having words stored at said addresses, said memory being connected to receive the generaed address and to read out the corresponding word stored at said address,

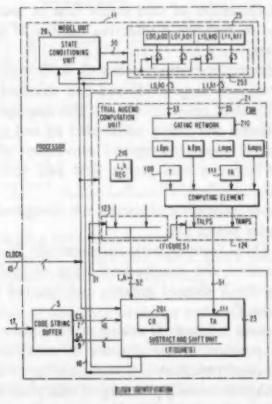
means for comparing for identity the word read out by said memory and the word received in said register, and

means for transmitting the memory address of said word, if, and only if, the comparing means indicates identity.

4,295,125
METHOD AND MEANS FOR PIPELINE DECODING OF THE HIGH TO LOW ORDER PAIRWISE COMBINED DIGITS OF A DECODABLE SET OF RELATIVELY SHIFTED FINITE NUMBER OF STRINGS

Glen G. Langdon, Jr., San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1980, Ser. No. 143,986
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **8 Claims**



7. An apparatus for recursively decoding an instantaneous FIFO binary arithmetic number string into a series of binary source symbols comprising:

first means **(23)** for generating a binary source symbol **(18)** by the magnitude comparison between a predetermined portion of an arithmetic code string applied thereto and an updated trial augend, said first means includes means **(202, 203)** responsive to a present integer-valued parameter for controlling the relative magnitude between the arithmetic code string and the updated trial augend; and means for generating a status signal (WASMPS, **31**) identifying the Boolean value of the previous bit decoded;

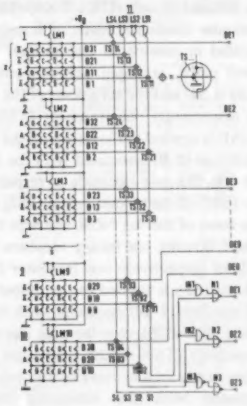
second means **(11)** responsive to the output signal for accessing K component/K candidate next integervalued control parameters **(L0, k0; L1, k1; 25)** and

third means **(21)** including a memory for storing vector representations of the present and K next candidate control parameters and K next trial augends for K-way selecting and updating the trial augend from said candidates and applying them to said first means in predetermined displaced time relation to the next candidate control parameters applied to said third means.

4,295,126
MOS-BINARY-TO-DECIMAL CODE CONVERTER

Dieter Holzmann, Freiburg, and Friedrich Schmidtpott, Hartheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 2, 1980, Ser. No. 193,205
Int. Cl.³ G06F *5/02*
U.S. Cl. 340—347 DD **1 Claim**



1. An MOS switching circuit for converting the code of an n-position binary number (n>3) into the code of the associated, at least two-place decimal number with the aid of MOS-gates which are controlled by the respective binary position signals or the complement thereof, corresponding to the binary positions of the binary number, said circuit comprising: a NOR-matrix **(1–10)** with s times z transistors arranged in a row- and column-wise manner (s=number of columns, z=number of rows), is provided for each of the ten digits in the units place (DE1–DE0) of the decimal numbers (D1–D32), in each NOR-matrix **(1–10)** the controlled current paths of the transistors of each row, hence the row transistors, are arranged in parallel with one another, and the controlled current paths of the transistors of each column, hence the column transistors, are arranged in series with one another, with the one end of each series arrangement being applied to the zero point of the circuit, and with the other end thereof, via a load transistor (LM1–LM10) which is common to all columns per NOR-matrix **(1–10)**, being applied to the supply voltage ($+U_B$), the number of columns s of the respective NOR-matrix **(1–10)**

equals n, the number of rows z is in the utmost equal to the number (d) of the decimal decades (DK) contained in the decimal number range (DB) as represented by the n-position binary numbers (B1–B32), to each row of the ten NOR-matrices (1–10) there is assigned one of the binary numbers (B1–B32) in such a way that in each NOR-matrix the binary numbers (B1, B11, B21, B31, etc.) are combined with the same decimal units digit (DE1–DE0), i.e. in such a way that the row as applied to the zero point of the circuit belongs to the binary number (B1–B10) with this decimal units digit from the lowest decimal decade (DK1), that the row which is the next higher one in direction towards the common load transistor (LM1) belongs to the binary number (B11–B20) with the same decimal units digit from the next higher decimal decade (DK2), etc. up to the row applied to the load transistor (LM1) which belongs to the binary number (B31, B32) with the same decimal units digit from the highest decimal decade (DK4), to the gate electrodes of the row transistors in a row belonging to one individual binary number (B1–B32) there are to be applied the position signals (A, B, C, D, E) of this binary number or else the complement thereof (A, B, C, D, E) so that in this way all row transistors of this particular row are switched to the non-conducting state, moreover, there is provided a multiple-NOR-gate (11) having p columns (S1–S4), with p being equal to the number (d) of the decimal decades (DK1–DK4) as contained in the decimal number range (DB) of the binary numbers (B1–B32), to each column (S1–S4) there is equidirectionally assigned one decimal decade (DK1–DK4) (S1 DK1, etc.), and this particular column consists of transistors (TS . . .) arranged parallel in relation to one another with their controlled current paths, arranged between one common load transistor (LS1–LS4) and the zero point of the circuit, the gate electrode of respectively one transistor (TS11–TS91) of the first column (S1) is applied to the output of the rows of the first nine NOR-matrices (1–9) associated with the first nine binary numbers (B1–B9), the gate electrode of respectively one transistor (TS02–TS92) of the second column (S2) is applied to the output of the rows of the ten NOR-matrices (1–10) as associated with the following ten binary numbers (B10–B19), the gate electrode of respectively one transistor (TS03–TS93) of the third column (S3), is applied to the output of the rows of the ten NOR-matrices (1–10) associated with the ten following binary numbers (B20–B29), etc., the gate electrode of respectively one transistor (TS04–TS24) of the last column (S4) is applied to the output of the rows of the ten NOR-matrices (1–10) associated with the remaining binary numbers (B30–B32), the output of the first column (S1) is applied via a first inverter (IN1) to the first input of a first decade-NOR-gate (N1) to the second input of which there is applied the output of the second column (S2), this output is applied via a second inverter (IN2) to the first input of a second decade-NOR-gate (N2), to the second input of which there is applied the output of the third column (S3), this output is applied via a third inverter (IN3) to the first input of a third decade-NOR-gate (N3), to the second input of which there is applied the output of the fourth column (S4), etc., up to reaching the highest decimal decade, at the output of the rows of the NOR-matrices (1–10) associated with the highest decimal decade (DK4 or DK3) there is to be taken off the signal for the digits (DE0–DE9) of the decimal units position (DE), and at the output of the decade-NOR-gate (N1–N3) there is to be taken off the signal for the digits (DZ1–DZ3) of the decimal-tens position (DZ), and all of the employed transistors are of the same conductivity type (n-channel or p-channel) as well as the same control type (depletion or enhancement type).

4,295,127

INFORMATION DISPLAY DEVICE

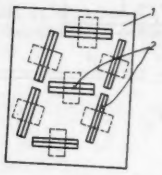
Helmut Sautter, Ditzingen; Kurt Hurst, Stuttgart, and Rainer Schink, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,639

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1977, 2747794

Int. Cl.³ G08B *5/00*

U.S. Cl. 340—373 **4 Claims**



1. Information display device having

a frame (1) furnishing a display surface;

a plurality of movable indicating elements (3, 13) arranged on said frame in segmental patterns representative of alphanumeric characters, and formed with at least two surface regions, one surface region having a visible aspect which essentially matches the visible aspect of the display surface and another, or other surface regions which have visible aspects contrasting with the visible aspect of the display surface, said indicating elements being movable to display respective surface regions so that, when any indicating element is in a first terminal position in which the visible aspects of the display surface and of the surface element matches, no display visible, but when the indicating element is in a second terminal position in which the visible aspects of the display surface and of the element differ, the element is visually recognizable,

and comprising

magnetic means (3, 4, 9) biassing said movable indicating element into one, or the other of said terminal positions and establishing the first and second positions as stable terminal positions;

control means (39–44, 46; 47, 57) to selectively place said elements in either of said stable first or second terminal positions to provide a selective display of alphanumeric characters;

electromagnetic operating means (3, 4, 7) including at least one permanent magnet (4) and one solenoid-electromagnet (7) located, respectively, on the display element and on the frame and being connected to and controlled by said control means to control movement of the display element between said stable first and second terminal positions;

said movable indicating elements are elongated, essentially rectangular plates (3);

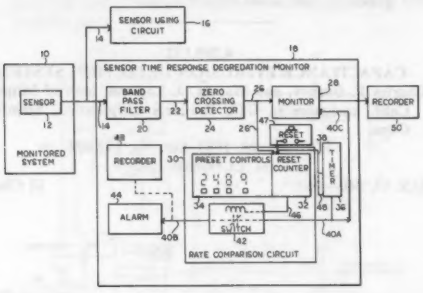
the frame (1) is formed with an essentially V-shaped elongated groove, the longitudinal edge of said plate being fitted in the V-shaped groove and located adjacent the apex thereof;

said permanent magnet (4) acting on said plate to hold said plate in position in the absence of energization of said solenoid-electromagnet (7), energization of said solenoid electromagnet causing pivoting of said plate about a pivot axis adjacent the apex of the V to move the plate from one, to the other of said stable terminal positions.

4,295,128
APPARATUS FOR MEASURING THE DEGRADATION OF A SENSOR TIME CONSTANT

Hashem M. Hashemian, Knoxville; Thomas W. Kerlin, Concord, and Belle R. Upadhyaya, Knoxville, all of Tenn., assignors to University of Tennessee Research Corp., Knoxville, Tenn.

Filed Mar. 26, 1979, Ser. No. 23,641
Int. Cl.³ G08B *27/00*
U.S. Cl. 340—506 **21 Claims**



1. A method for monitoring changes in the response time of a sensor while said sensor monitors fluctuations in a selected perameter comprising the steps of:

providing a sensor signal from said sensor being monitored, said sensor signal indicative of fluctuations of said selected parameter;

receiving said sensor signal and monitoring when the value of said sensor signal crosses a selected signal level;

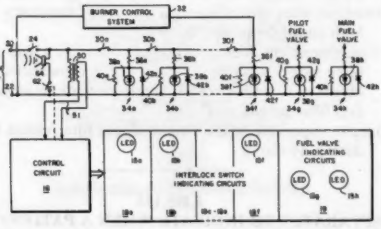
determining the number of times said sensor signal crosses said selected level in a selected time period to obtain a crossing rate; and

comparing said crossing rate with a nominal crossing rate of determine a change in the response time of said monitored sensor.

4,295,129
SYSTEM CONDITION INDICATOR

Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed May 7, 1979, Ser. No. 36,547
Int. Cl.³ G08B *23/00*
U.S. Cl. 340—520 **15 Claims**



1. For use with a burner control system including a plurality of interlock switches, a main fuel valve, and a pilot fuel valve, a system condition indicator comprising;

a plurality of interlock monitor means, equal in number to the number of interlock switches and each associated with and connected to respective ones of the plurality of interlock switches, for determining the absence of an AC power line signal at a terminal of the associated interlock switch and for providing an output signal representative thereof;

main monitor means associated with and connected to the main fuel valve for providing an output signal representative of the open or closed state of the main fuel valve;

pilot monitor means associated with and connected to the pilot fuel valve for providing an output signal representative of the open or closed state of the pilot fuel valve; and

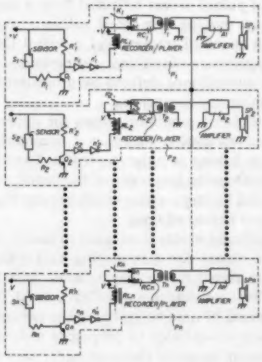
detection means responsive only to the interlock monitor means output signals, the main monitor means output signal, and the pilot monitor means output signal, for detecting an abnormal condition in the interlock switches and fuel valves and for providing an indication, in response to a detected abnormal condition, of which of said valves and interlock switches was first to go to an abnormal condition;

wherein abnormal conditions include an open interlock switch, the main fuel valve going from an open state to a closed state, and the pilot fuel valve going from an open state to a closed state before the main fuel valve goes to an open state.

4,295,130
AUDIO-VISUAL DISASTER ALERT SYSTEM

Yang Tai-Her, No. 9-1, Tai-Ping St., Kung-Hua Li, Hsi-Hu Town, Chang Hua Hsien, Taiwan

Filed Jun. 18, 1979, Ser. No. 49,806
Int. Cl.³ G08B *19/00*
U.S. Cl. 340—524 **7 Claims**

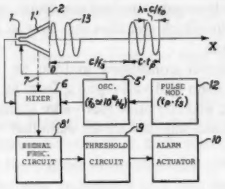


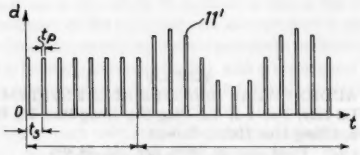
1. An audio/visual disaster alert system for a plurality of areas in a building or the like comprising, in combination, a disaster warning circuit in each of said areas, an associated source of electric power, each of said disaster warning circuits including sensing means responsive to a disaster for producing an out signal a normally inoperative tape recorder/player having an audio output for providing a taped message stating the location of the disaster and the disaster measures to be taken and a speaker connected to said tape recorder/player audio output, means responsive to said output signal from said sensing means in each of said areas for activating the associated tape recorder/player to provide an audio output, means for feeding the audio output of said activated tape recorder/player to the associated speaker in said area and means for interconnecting the audio output from said activated tape recorder/player to all of the speakers in said areas, whereby the message from said activated tape recorder/player is supplied to the speakers in all of said disaster warning circuits.

4,295,131
LOW CONSUMPTION PULSES DOPPLER EFFECT INTRUSION SENSOR

Maurizio Bonori, and Cafiero Franconi, both of Rome, Italy, assignors to AD.ELE. -Advanced Electronics- S.R.L., Rome, Italy

Filed Apr. 19, 1978, Ser. No. 897,776
Claims priority, application Italy, May 10, 1977, 49333 A/77
Int. Cl.[3] G01S *13/56*; G08B *13/18*
U.S. Cl. 340—554 **7 Claims**





1. An intruder alarm sensor for detecting, from the Doppler information of pulsed waves reflected from a target, the presence of a target moving at a speed within a range between a slowest target speed of interest and a fastest target speed of interest in the presence of stationary or periodic interference in a zone under surveillance defined by a maximum range, said intruder alarm sensor comprising:

a pulse modulated oscillator means for generating a pulse modulated oscillation signal at a predetermined carrier frequency having a pulse repetition frequency at least twice the Doppler frequency of the fastest target speed of interest and having a pulse width greater than a first predetermined period of time;

a first transducing means connected to said pulse modulated oscillator means for transmitting said pulse modulated oscillation signal for propagation as pulsed wave fields within the zone under surveillance, said first predetermined period of time being twice the period required for said pulsed wave fields to propagate a distance equal to the maximum range of the zone under surveillance;

a second transducing means for receiving pulsed wave signals reflected by a target within the zone of surveillance and for transforming said received pulsed wave signals into pulsed oscillatory electric signals having Doppler information corresponding to the relative motion between the target and said first transducing means;

mixing means connected to said pulse modulated oscillator means and said second transducing means for mixing said pulse modulated oscillation signal and said pulsed oscillatory electric signals for producing a detected pulse signal having said pulse repetition frequency and having amplitude modulation corresponding to said Doppler information, said detected pulse signal having a center frequency and an amplitude modulated bandwidth equal to twice the difference between the Doppler frequency of the fastest target speed of interest and the Doppler frequency of the slowest target speed of interest;

a processing means connected to said mixing means for demodulating said Doppler information which is amplitude modulated on said detected pulse signal for generating a Doppler information signal having an amplitude proportional to the value of said Doppler information;

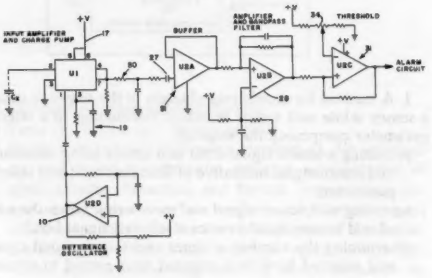
a comparing means connected to said processing means for comparing said Doppler information signal with a predetermined threshold level for generating an alarm trigger signal when the level of said Doppler information signal exceeds said predetermined threshold level; and

an alarm actuating means connected to said comparing means for actuating an alarm when said comparing means generates said alarm trigger signal.

4,295,132
CAPACITANCE INTRUSION DETECTION SYSTEM

Charles F. Burney, and Marvin D. Laymon, both of Milpitas, Calif., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 28, 1980, Ser. No. 172,602
Int. Cl.[3] G08B *13/26*
U.S. Cl. 340—562 **11 Claims**



1. An intrusion detection system for an object having a capacitance comprising

a charge pump having an input and an output,

a voltage source connected to said input,

said object being connected to said output of the charge pump,

means to cyclically switch said charge pump between first and second states whereby alternately to connect and disconnect said voltage source and said object for successively charging the latter,

storage means connected to said charge pump for producing a DC voltage proportional to the charge on said object,

bandpass filter means having a low cutoff frequency f_1 and a high cutoff frequency f_2,

capacitor means interconnecting said storage means and said filter means whereby changes in the capacitance of said object at a rate between f_1 and f_2 produce an output from said filter means, and

means responsive to the output of said filter means for producing an alarm.

4,295,133
APPARATUS TO INDICATE WHEN A PATIENT HAS EVACUATED A BED OR DEMONSTRATES A RESTLESS CONDITION

Dwight A. Vance, 8709 E. 29th, Tulsa, Okla. 74129

Continuation-in-part of Ser. No. 794,041, May 5, 1977. This application Oct. 10, 1978, Ser. No. 949,969
The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.
Int. Cl.[3] G08B *21/00*
U.S. Cl. 340—573 **11 Claims**

1. A monitoring system for a bed patient, comprising:

(a) a binary signal generating means adapted to indicate one of two possible positions of a body in a bed; and producing

a first signal when said body is in a rest position in said bed; and a second signal when said body is out of said bed;

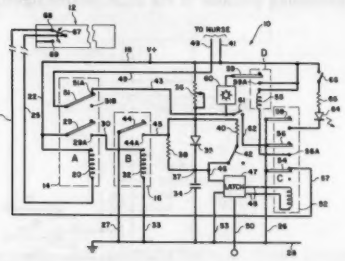
(b) signal processing means comprising:

(1) oscillator means actuated responsive to said second signal, said oscillator means comprising;

(i) a first and a second NAND gate;

(ii) one input lead from each gate connected to a selected terminal responsive to said second signal;

(iii) the output of said second gate connected through a capacitor and first resistor to the second input of said first NAND gates;



(iv) the output of said first NAND gate connected to the second input terminal of said second NAND gate;

(v) a series second resistor and third resistor connected between the output of said first NAND gate and the junction between said capacitor and said first resistor;

(2) counter means responsive to said oscillator means;

(3) latch means responsive to a selected count of said counter means;

(4) alarm means responsive to the setting of said latch means.

4,295,134

LIQUID FLOW DETECTING DEVICE

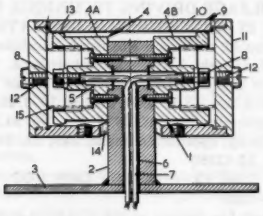
Anthony C. Fairlie-Clarke, Edinburgh, Scotland, assignor to Vickers Limited, London, England

Filed Jul. 11, 1979, Ser. No. 56,649

Claims priority, application United Kingdom, Jul. 12, 1978, 29638/78

Int. Cl.³ G08B *21/00*; G01F *15/06*

U.S. Cl. 340—610 **10 Claims**



1. A liquid flow detecting device incorporating a static member arranged to be fixed within a passage through which flow of an operating liquid is to take place and an active member held captive in space by the static member but physically separate from the static member and free to undergo a displacement relatively to the static member to a limited extent in one particular direction at least and having an overall specific gravity substantially the same as that of the chosen operating liquid and proximity sensing apparatus operative to detect movement of the active member relative to the static member in the particular direction and issue a corresponding signal.

4,295,135

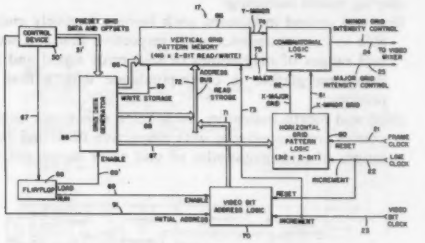
ALIGNABLE ELECTRONIC BACKGROUND GRID GENERATION SYSTEM

Josef Sukonick, 10395 Dempter Ave., Cupertino, Calif. 95014

Filed Dec. 18, 1978, Ser. No. 970,755

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—734 **31 Claims**



1. An alignable electronic background grid generation system for use with a raster-type video graphics display unit on which graphic data is displayed, comprising:

control means for supplying alterable grid pattern and offset data,

vertical grid pattern generation means, cooperating with said control means and synchronized with the display unit horizontal video scan, for providing in response to said alterable grid pattern data vertical grid pattern defining signals indicative of requisite background grid spots at horizontal picture element locations corresponding to desired vertical background grid lines specified by said grid pattern data,

horizontal grid pattern generation means, cooperating with said control means and synchronized with the display unit vertical line scan, for providing in response to said alterable grid pattern data horizontal grid pattern defining signals indicative of a desired horizontal grid line pattern specified by said grid pattern data, and

combinatorial logic means, cooperating with both said vertical and horizontal grid pattern generation means, for combining said provided vertical and horizontal grid pattern defining signals and producing as a result of said combination a set of grid intensity or color control signals,

said grid intensity control signals being supplied to said video gaphics display unit to be mixed with the other video signals defining said graphic data being displayed, said display unit thereby producing a composite display including both said graphic data and said background grid.

4,295,136

INDICATING APPARATUS, PARTICULARLY FOR VIBRATION ANALYZING EQUIPMENT

Donn V. Stoutenburg, Westerville, Ohio, assignor to IRD Mechanalysis, Inc., Columbus, Ohio

Filed Sep. 17, 1979, Ser. No. 76,030

Int. Cl.³ G06F *3/14*; H04N *5/50*

U.S. Cl. 340—753 **9 Claims**

1. Apparatus for facilitating the manual selection and readout of the center frequency of an a.c. signal which corresponds with a characteristic amplitude comprising:

a tunable filter of a variety wherein the passband center frequency thereof is selectable as a function of a tuning input signal applied at a tuning input thereof, said filter receiving said a.c. signal and providing a filtered signal at an output;

error circuit means responsive to said a.c. signal and said filtered signal for deriving an error signal of magnitude and polarity corresponding to the relationship of said

tuning input and a frequency associated with said characteristic amplitude;

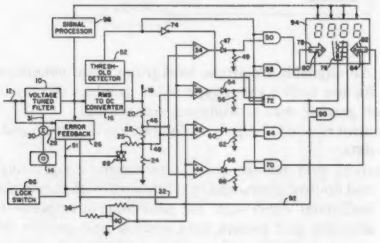
manually actuable means movable in first and second directions for deriving said input signal;

means for deriving first and second reference level signals including converter means responsive to said filtered signal for providing said reference level signals as d.c. voltages proportioned with said filtered signal; and

display means including:

first and second indicators, each being selectively energizable in correspondence with respective first and second said ranges of magnitudes of said error signal and each being energizable in correspondence with a first said polarity;

third and fourth indicators, each being selectively energizable in correspondence with respective third and fourth ranges of said magnitudes of said error signal and each



being energizable in correspondence with a second said polarity; and

fifth indicator means energizable when said filtered signal substantially corresponds with said center frequency;

electrical circuitry responsive to said error signal and said first reference level signal for energizing said first indicator in the presence of said first polarity and said first magnitude range, for energizing said second indicator in the presence of said first polarity and said second magnitude range, for energizing said third indicator in the presence of said second polarity and said third magnitude range, and for energizing said fourth indicator in the presence of said second polarity and said fourth magnitude range, and for energizing said fifth indicator substantially in the absence of said error signal, said second and fourth magnitude ranges being of lesser value than said first and second magnitude ranges.

4,295,137

ELECTROLUMINESCENT DISPLAY DRIVER SYSTEM FOR THIN-FILM ELECTROLUMINESCENT DEVICES REQUIRING ELECTRIC FIELD REVERSAL

Paul O. Haugsjaa, Acton, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 7, 1980, Ser. No. 110,161

Int. Cl.[3] G06F *3/14*

U.S. Cl. 340—781 **15 Claims**

1. An electroluminescent display system comprising:

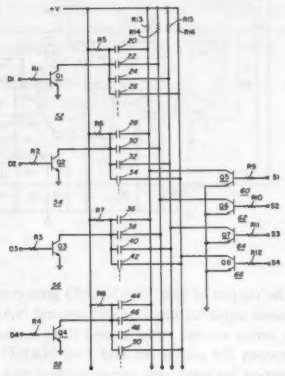
a plurality of thin-film electroluminescent elements each having a digit electrode and a segment electrode and having associated therewith a characteristic electroluminescent threshold voltage;

a set of digit driver means each selectively coupled to digit electrodes of the elements of said display and having an input terminal for receiving a digit control signal including precharging portions and addressing portions; and

a set of segment driver means each selectively coupled to segment electrodes of the elements of said display and having an input terminal for receiving a segment control signal including precharging portions and energizing portions which are simultaneous with the addressing portions of the digit control signal;

said set of digit driver means and said set of segment driver means being operative, during precharging portions of digit and segment control signals, to precharge the elements of said display by applying a first voltage to the digit electrode and a second voltage to the segment electrode of each element of said display, said first and second voltages having a difference therebetween which is greater in magnitude than said threshold voltage,

said set of digit driver means being further operative, during addressing portions of the digit control signal, to selec-



tively address elements of said display by applying said second voltage to the digit electrodes of the elements of said display which are to be addressed and by applying said first voltage to the digit electrodes of the elements of said display which are not to be addressed,

said set of segment driver means being further operative, during energizing portions of the segment control signal, to selectively energize elements of said display which are addressed by applying said first voltage to the segment electrodes of the elements which are to be energized and by applying said second voltage to the segment electrodes of the elements which are not to be energized.

4,295,138

COMBINED CONSTANT POTENTIAL AND CONSTANT VOLTAGE DRIVING TECHNIQUE FOR ELECTROCHROMIC DISPLAYS

Hiroshi Nakauchi; Katubumi Koyanagi; Yasuhiko Inami, all of Tenri, and Hisashi Uede, Yamatokoriyama, all of Japan, assignors to Sharp Corporation, Osaka, Japan

Continuation of Ser. No. 873,504, Jan. 30, 1978, abandoned. This application Nov. 16, 1979, Ser. No. 94,933

Claims priority, application Japan, Jan. 31, 1977, 52-10120; Feb. 4, 1977, 52-12350

Int. Cl.[3] G06F *3/14*; G09F *9/32*

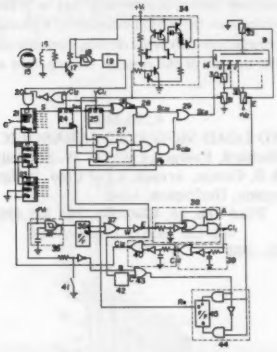
U.S. Cl. 340—785 **9 Claims**

1. A method for driving an electrochromic display cell to exhibit electrochromic phenomenon at said display cell, said display cell including a counter electrode, a plurality of display electrodes and a reference electrode, said method comprising the steps of:

driving said electrochromic display cell by maintaining a constant potential at respective ones of said display electrodes relative to said reference electrode when it is desired to color said respective ones of said display electrodes despite variations in the amount of energizing current supplied to said counter electrode in response to increases and decreases in the number of said display electrodes having their display states changed thereby

maintaining the degree of coloration of said respective ones of said display electrodes uniform; and

driving said electrochromic display cell by maintaining a constant voltage between said display electrodes and said



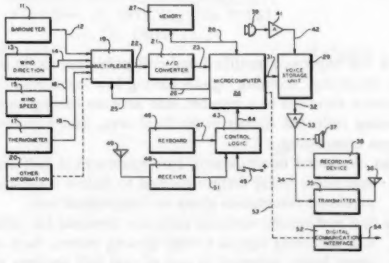
counter electrode when it is desired to bleach said respective ones of said display electrodes thereby maintaining the degree of bleaching of said respective ones of said display electrodes uniform.

4,295,139

METHOD FOR TRANSMITTING AIRPORT WEATHER INFORMATION

Roberto Arpino, 4722 Shire Ridge Rd. West, Columbus, Ohio 43220

Filed May 7, 1979, Ser. No. 36,518
Int. Cl.³ G01W *1/10*; G01C *21/00*
U.S. Cl. 340—870.01 **7 Claims**



1. A method of transmitting a plurality of types of real-time weather information to a remotely located receiver comprising the steps of:

a. generating a signal representing instantaneous weather information;

b. determining a real-time weather information value from said instantaneous weather information signal over a predetermined time interval;

performing said steps (a) and (b) for each one of said types of real-time weather information in sequence;

c. generating an address signal representing said real-time weather information value;

d. storing a plurality of signals representing real-time weather information messages;

e. generating the one of said message signals corresponding to the real-time weather information value in response to said address signal;

f. transmitting said one message signal to the receiver; and

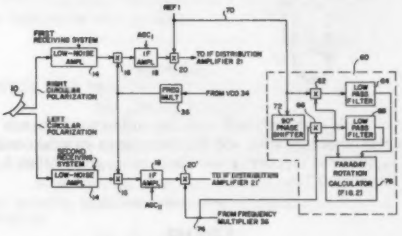
performing steps (c) through (f) for each one of said types of real-time weather information in sequence.

4,295,140

FARADAY ROTATION MEASUREMENT METHOD AND APPARATUS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Milton H. Brockman, Glendale, Calif.

Filed Dec. 21, 1979, Ser. No. 106,119
Int. Cl.³ H04B *7/00*
U.S. Cl. 343—100 PE **15 Claims**



1. In an rf receiver array having at least a first and second receiving system, said first receiving system having a reference signal for forming an IF signal and said second receiving system having a tracking feedback signal whose phase is related to the phase of a received signal, a measurement means for determining Faraday rotation of said received signal comprising:

a first phase detector;

a second phase detector;

means for providing said reference signal to said first phase detector;

means for providing said reference signal phase-shifted by a predetermined phase increment to said second phase detector;

means for providing said feedback signal to said first and second phase detectors;

first means for generating a plurality of first occurrence time signals when said first phase detector output defines a predetermined phase relationship between said reference signal and said feedback signal;

second means for generating a plurality of second occurrence time signals when said second phase detector output defines said predetermined phase relationship between said phase-shifted reference signal and said feedback signal;

third means for generating a plurality of cyclically occurring comparison signals having a cycle time related to an average time between a predetermined number of occurrence time signals from said first phase detector output signal; and

means for determining the phase relationship between said cyclically occuring comparison signals and said second occurrence time signals, said phase relationship being related to Faraday rotation of said received signal.

4,295,141

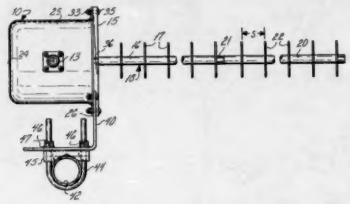
DISC-ON-ROD END-FIRE MICROWAVE ANTENNA

Richard D. Bogner, 4 Hunters La., Roslyn, N.Y. 11576

Continuation-in-part of Ser. No. 938,883, Sep. 1, 1978, abandoned. This application May 14, 1980, Ser. No. 149,664
Int. Cl.³ H01Q *13/28*
U.S. Cl. 343—753 **12 Claims**

1. A plate-on-rod end-fire antenna comprising a launcher and end-fire radiator exhibiting close to optimum gain over a range of lengths between 3λ and 12λ where λ is the wavelength at the operating frequency, and having a principal axis adapted to be energized by the launcher at the non-radiating end of said radiator for the transmission of energy wavelength λ in the direction of the axis, the electrically active components of said radiator consisting of a plurality of substantially thin

identical electrically conductive round plates substantially uniformly spaced between 0.18λ and 0.23λ apart, along said axis, with the plane of the plates normal to said axis, to form an elongated radiator fitting within a circumscribing cylinder,



coaxial with said principal axis, the difference between the diameter of said cylinder and the diameter of an axial conductive support rod supporting said plates being greater than 0.23λ and less than 0.27λ.

4,295,142

CORRUGATED HORN RADIATOR

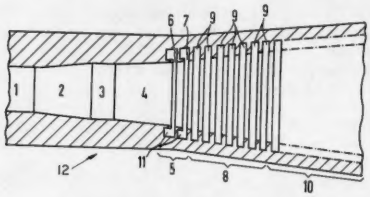
Helmuth Thiere, Munich, and Werner Vallentin, Groebenzell, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 22, 1980, Ser. No. 171,143

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1979, 2930932

Int. Cl.³ H01Q *19/12, 13/02*

U.S. Cl. 343—781 CA **7 Claims**



1. A corrugated horn radiator in which a transition zone is inserted between a smooth-walled wave guide feed with a constant cross-section and a funnel radiator with a regularly periodic corrugation structure with a corrugation depth of less than a quarter wave length with reference to the lowest operating frequency, characterized in that, proceeding from the said wave guide feed (**1**), the transition zone consists of the following sections attached to one another in the following order:

(a) a uniformly expanding, smooth-walled wave guide section (**2**),

(b) a smooth-walled wave guide section (**3**) designed with a constant cross-section connected to wave guide section (**2**),

(c) a smooth-walled funnel section (**4**) connected to wave guide section (**3**) smoothly and bend-free and which continuously increases in diameter particularly exponentially, with respect to its cross-section dimension,

(d) a funnel section connected to wave guide section (**4**) smoothly and bend-free, continuously increasing in diameter, particularly exponentially, with respect to its cross-section dimension, said funnel section having a first matching adaptation zone (**5**) which consists of at least two successive corrugations (**6, 7**) which are dimensioned considerably narrower with respect to their widths than are the corrugations of the periodic corrugation structure (**10**) and are also suitably matched in width, which exceed in depth the corrugation depths in the periodic corrugation structure (**10**) and which are provided with ring-shaped openings (**11**) which extend in the direction toward the wave guide feed (**1**), said openings (**11**) being approximately one eighth a wave length deep with respect to the lowest operating frequency to be transmitted, and

(e) a uniformly increasing funnel section with respect to its cross-section dimension which has a second matching adaptation zone (**8**) which consists of a plurality of successive corrugations (**9**) with depths continuously graduated up to the depths of the regular corrugation structure (**10**).

4,295,143

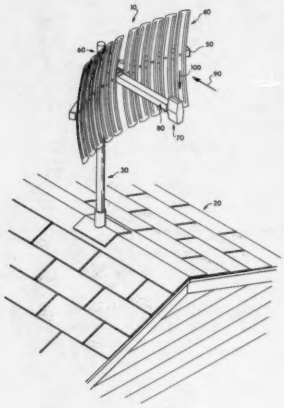
LOW WIND LOAD MODIFIED FARABOLIC ANTENNA

John R. Winegard, Evergreen; Carey W. Shelledy, Lakewood, and Keith B. Cowan, Arvada, all of Colo., assignors to Winegard Company, Burlington, Iowa

Filed Feb. 15, 1980, Ser. No. 121,696

Int. Cl.³ H01Q *19/12, 15/20*

U.S. Cl. 343—840 **24 Claims**



1. An improved modified and collapsible parabolic antenna for receiving incoming signals having low wind load characteristics mounted to a support, said antenna having means for sensing reflected signals in its focal area, said improved antenna comprising:

an elongated boom having two symmetrical half sections, said boom being further formed to follow a substantially parabolic orientation along its longitudinal axis,

a first and second series of reflector elements for reflecting said incoming signals to said sensing means, each of said series being mounted to one of said half sections of said boom, each of said first and second series of reflector elements comprising:

(a) a plurality of thin substantially elongated rectangular elements of equal length being formed in the substantial shape of a parabola along its longitudinal axis, and

(b) means for mounting the mid-section of each of said elements in a substantial perpendicular relationship to said boom at equal predetermined spaced distances from each other, said predetermined spaced distance being determined in a plane perpendicular to the path of said incoming signals, and

means releasably connectable to said support for mounting to one end of each of said boom half sections in the region of the vertex of said boom parabolic shape, said boom half sections being capable of pivoting in said mounting means from an outward position wherein said boom half sections form said parabolic shape to an inward position wherein said boom half sections are in substantial opposing parallel relationship.

4,295,144

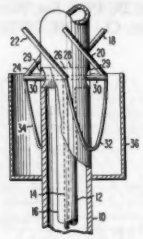
FEED SYSTEM FOR A CIRCULARLY POLARIZED TETRA-COIL ANTENNA

Joseph J. Matta, Cinnaminson, and Andrej Skalina, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1980, Ser. No. 136,155

Int. Cl.³ H01Q *1/36*

U.S. Cl. 343—895 **8 Claims**



1. An antenna comprising a central conductive mast, at least first and second conducting helices disposed about said mast, a conductive housing disposed proximate an end of said helices, a coaxial transmission line disposed within said mast, the inner conductor of said line extending into said housing and being coupled to said first helix, and a first belt line disposed in said housing and coupled between said helices and having a selected length to provide a selected phase shift between said helices and being folded to conserve space.

4,295,145

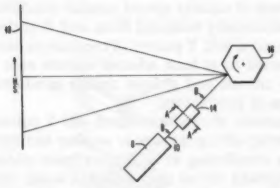
ACOUSTO-OPTICALLY MODULATED LASER SCANNING ARRANGEMENT FOR CORRECTING FOR INTERFERENCE APPEARING THEREIN

Milton R. Latta, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,632

Int. Cl.³ G01D *15/14*

U.S. Cl. 346—108 **8 Claims**



1. An acousto-optically modulated light scanning system of the type wherein light from a laser beam is deflected in one direction by acousto-optical apparatus operating at a plurality of different frequencies and thereafter deflected in another direction by other optical apparatus for creating an image raster display in a multiple of scan lines spaced apart by a designated scan line spacing, which scanning normally would include undesirable effects of intermodulation products including spot overlap in said display,

said system comprising

laser apparatus for generating a beam of coherent light,

acousto-optical modulating apparatus arranged for intercepting light from said laser apparatus and for deriving at least a plurality of beams that are individually modulatable, and for independently and simultaneously modulating said derived beams to form at least a plurality of sequentially modulated beams for creating a display, and

characterized by

said acousto-optically modulating apparatus being arranged for extending the angle between said individually and simultaneously modulated light beams by at least triple the angle at which said designated scan line spacing obtains on said display, and

said system being arranged simultaneously for projecting at least two of said simultaneously and individually modulated light beams onto said display in coincidence with at least two scan lines spaced apart at an integral number greater than two of intervals of said designated scan line spacing whereby simultaneous spot overlap is prevented for obviating distortion that otherwise would result from said intermodulation products.

4,295,146

DEVICE FOR MOVING AUTOMATIC DRAWING MACHINE TOOLS

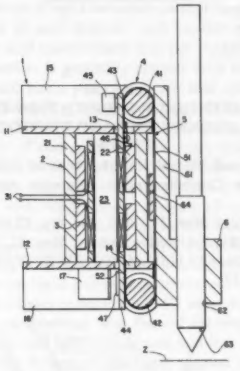
Werner Cordes, Hamburg, Fed. Rep. of Germany, assignor to Aristo Graphic Systeme GmbH & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,477

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934273

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **11 Claims**



1. An improved device for translational movement of automatic drawing machine tools, comprising a frame capable of being connected to a drawing machine, and a permanent magnet system, wherein a controlling plunger is attached for free movement, with respect to said frame, and said plunger is connected to a tool carrier which accepts a writing tool, wherein further, an electromagnetic control coil (3) around said plunger, is interconnected to said tool carrier (6) by means of a mechanical linkage on said frame (1), to move said plunger and carrier in opposite directions.

4,295,147

JOSEPHSON DEVICES OF IMPROVED THERMAL CYCLABILITY AND METHOD

Charles J. Kircher, Yorktown Heights; Hung-Chang W. Huang, Hopewell Junction, and Masanori Murakami, Yorktown Heights, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 1, 1980, Ser. No. 117,790

Int. Cl.³ H01L *39/22*

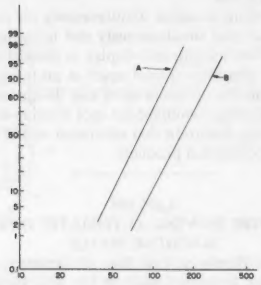
U.S. Cl. 357—5 **23 Claims**

1. A tunnel device exhibiting Josephson tunneling current comprising:

(a) a first electrode comprised of at least one superconductor, the grain size of the said superconductor being $\lesssim$ 100 nm;

(b) a tunnel barrier in contact with said first electrode com-

prised of an insulating layer and being sufficiently thin that Josephson current can tunnel therethrough; and



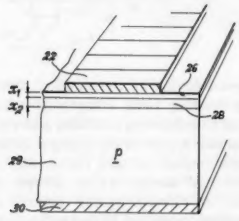
(c) a second electrode in contact with said tunnel barrier comprised of a superconductor.

4,295,148

METHOD OF FABRICATION OF ELECTROLUMINESCENT AND PHOTODETECTING DIODES

Jean Marine, and Michel Ravetto, both of Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 21, 1979, Ser. No. 22,607
Claims priority, application France, Mar. 23, 1978, 78 08522
Int. Cl.³ H01L *33/00, 31/00, 31/18*
U.S. Cl. 357—17 **13 Claims**



1. A method of fabricating electroluminescent and photodetecting diodes, comprising

(a) providing a wafer of p-type ZnTe semi-conductor material;

(b) forming a compensated layer of thickness x_j in a first surface of said wafer in such a manner as to provide insulation with high resistivity;

(c) implanting ions in the first surface with sufficient energy to form a trapping region of thickness x_1 and to form beneath said trapping region an insulating region of thickness x_2, with $x_1 < x_j$; and

(d) forming a metallic contact layer on a second surface of the wafer.

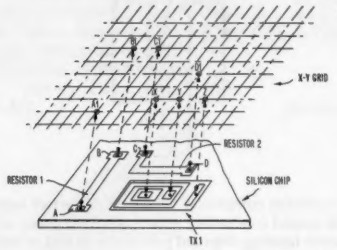
12. An electroluminescent and/or photodetecting diode of ZnTe comprising a substrate of p-type ZnTe, a trapping region at a surface of the substrate, a resistive region below said trapping region having a resistivity of the order of 10^7 to 10^9 cm, and an electrical surface contact.

4,295,149

MASTER IMAGE CHIP ORGANIZATION TECHNIQUE OR METHOD

John Balyoz, Hopewell Junction; Chi S. Chang, Wappingers Falls; Barry C. Fox, Poughkeepsie; John A. Palmieri, Wappingers Falls; Majid Ghafghaichi, Poughkeepsie; Teh-Sen Jen, Fishkill, and Donald B. Mooney, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,576
Int. Cl.³ H01L *27/10*
U.S. Cl. 357—45 **6 Claims**



1. In an improved planar semiconductor integrated circuit chip structure, said chip structure having:

a surface from which a plurality of regions of different conductivity type extend into the chip to provide a plurality of electrically isolated functional circuits, each of said functional circuits including the required interconnected components to provide the function thereof;

at least one of said functional circuits being a transistor-transistor logic functional circuit, at least one of said functional circuits being an emitter coupled logic functional circuit, and at least one of said functional circuits being a Schottky-Transistor logic functional circuit;

an X pattern of equally spaced parallel conductors overlying and electrically insulated from said chip structure surface, said X pattern of conductors being minimally spaced one from another and selectively connected to at least selected certain ones of said functional circuits;

a Y pattern of equally spaced parallel conductors overlying and electrically insulated from said X pattern of parallel conductors, said Y pattern of conductors being selectively connected to at least selected certain ones of said functional circuits and at least certain conductors of said X pattern of conductors;

said X pattern of conductors and said Y pattern of conductors being orthogonal one to another and thereby geometrically manifesting an X, Y coordinate system;

said integrated circuit chip structure being characterized in that all connections between said X pattern conductors, said Y pattern conductors and said functional circuits exist in space only at X, Y intersections of said X-Y coordinate system geometrically manifested by said X and Y patterns of conductors.

4,295,150

STORAGE TRANSISTOR

Fritz G. Adam, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,869
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1978, 2845328
Int. Cl.³ H01C *29/78;* **G11C** *11/40*
U.S. Cl. 357—54 **14 Claims**

1. A storage transistor, comprising:

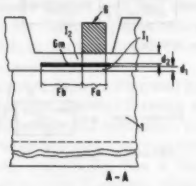
a substrate formed of a semiconductor body having a plane surface;

a source region formed in said surface;

a drain region formed in said surface and spaced from the source region forming a channel region therebetween;

a gate electrode disposed over said channel region;

a storage medium comprising a layer of semiconducting material, said storage medium having a first portion disposed between the gate electrode and channel region and a second portion extending from between the channel region and gate electrode, the ratio of the surface area of the second portion of the storage medium to the first portion of the storage medium being between 2 and 3;



a first partial gate insulator layer disposed between the storage medium and the channel region having a thickness ranging between approximately 100 and 200 A.U.; and

a second partial gate insulator layer disposed between the storage medium and the gate electrode and having a thickness ranging beween approximately 200 and 500 A.U., whereby a write or erase pulse may be applied to the gate electrode for storing or removing a charge into or from the storage medium respectively thereby displacing the threshold voltage and a read pulse may be applied to the gate electrode for scanning the magnitude of the threshold voltage.

4,295,151

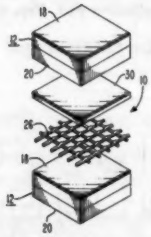
METHOD OF BONDING TWO PARTS TOGETHER AND ARTICLE PRODUCED THEREBY

Paul Nyul, New Holland, and Frederick R. Hughes, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 14, 1980, Ser. No. 111,814

Int. Cl.³ H01U *23/48*

U.S. Cl. 357—68 **4 Claims**



1. An array of laser diodes comprising

a pair of laser diodes each being a body of semiconductor material having top and bottom surfaces and an edge surface from which light is adapted to be emitted, said diodes being arranged with the top surface of one being in spaced opposed relation to the bottom surface of the other,

an intermediate member between said opposed surfaces of the laser diodes and having a separate surface contacting each of said opposed surfaces of said laser diodes, said intermediate member having a plurality of openings therethrough, and

a bonding material in the openings in the intermediate member and adhered to the opposed surfaces of said diodes to secure the diodes together.

4,295,152

OPTICAL COUPLER WITH A HOUSING PERMITTING ADJUSTMENT OF THE DISTANCE BETWEEN THE LIGHT SOURCE AND THE LENS

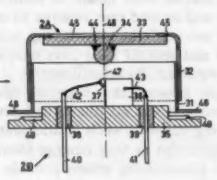
Giok D. Khoe; Hendrikus G. Kock; Lambertus J. Meuleman, and Lodewijk J. Van Ruyven, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1979, Ser. No. 44,611

Claims priority, application Netherlands, Jun. 19, 1978, 7806569

Int. Cl.³ H01L *23/12, 23/02, 27/14*

U.S. Cl. 357—74 **8 Claims**



1. An optical coupler comprising a support, a light source for emitting a beam of light mounted on said support, a tubular member affixed to said support, said tubular member being disposed about said source such that the longitudinal axis of said tubular member is generally coaxial with the axis of said beam so that said beam passes through said tubular member along the axis thereof, a holder having a cylindrical portion and a hole formed therethrough, said hole extending along the longitudinal axis of said cylindrical portion, a lens, means for supporting said lens on said holder adjacent one end of said cylindrical portion so that said lens is centered about the longitudinal axis of said hole, the end portion of said cylindrical portion opposite said one end being in telescoping engagement with said tubular member so that said axis of said cylindrical portion is coaxial with the axis of said tubular member and so that said holder and said lens supported thereon is displaceable relative to said tubular member and said support in a direction parallel to the longitudinal axes thereof thereby enabling the distance between said light source and said lens to be adjusted while maintaining the axis of said beam aligned with the center of said lens.

4,295,153

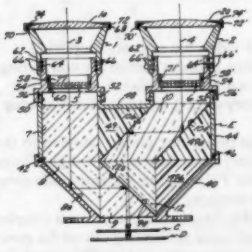
STEREOSCOPIC APPARATUS AND METHOD OF USING SAME

Stephen Gibson, 547 N. Beachwood Dr., Los Angeles, Calif. 90004

Filed Mar. 31, 1980, Ser. No. 135,471

Int. Cl.³ H04N *9/54, 9/60*

U.S. Cl. 358—3 **9 Claims**



1. In combination with a camera that includes a housing on which a lens assembly is removably supported by first means on the exterior thereof to record a two-dimensional of a scene

on light sensitive means on the interior of said housing, an apparatus that may replace said lens assembly and transform said camera to one that is capable of recording superimposed left and right hand perspective views of said scene that are of the same size on said light sensitive means and that impart a stereoscopic effect to a user when viewed through suitable filters and that appear as a conventional two-dimensional record when viewed without a filter, said apparatus including: p1 a. first and second lenses of the same focal length that are laterally spaced and lie in a common transverse plane that transmit first and second light rays that represent left and right hand perspective views of said scene;

b. first and second filter means to control the luminosity of said first and second rays relative to one another;

c. first and second light transmitting means through which said first and second light rays pass in first and second paths of substantially equal length;

d. an opaque housing that supports said first and second lenses, first and second filters, and first and second light transmitting means in such relationship that said first and second light rays as they emerge from said first and second light transmitting means provide real left and right hand perspective images of said scene that are super imposed; and

e. second means on said housing that removably secure said housing to said first means for said real left and right hand perspective images to be projected from said first and second light transmitting means onto said light sensitive means in said camera.

4,295,154

DIGITAL VIDEO AND AUDIO FILE SYSTEM

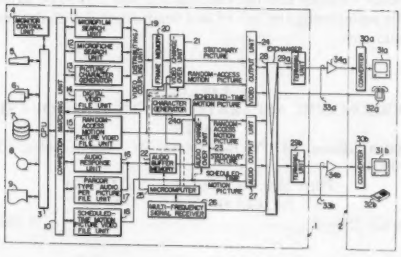
Hidetoh Hata, Yokohama; Katsumi Haji, Narashino; Kazushige Sako, Tokyo; Yoji Shibata, Yokohama, and Masahiko Achiha, Iruma, all of Japan, assignors to Nippon Telegraph, Telephone Public Corp. and Hitachi, Ltd., both of Tokyo, Japan

Filed Aug. 3, 1979, Ser. No. 63,467

Claims priority, application Japan, Aug. 4, 1978, 53-94586; Aug. 4, 1978, 53-94588

Int. Cl.³ H04N 5/76

U.S. Cl. 358—4 **12 Claims**



1. A digital video file system comprising:

a high efficiency encoder circuit for converting an analog TV signal into a digital TV signal;

a buffer memory circuit for temporarily storing the digital TV signal;

a digital signal processing circuit coupled to the output of the buffer memory for reducing in the digital form a redundancy of the digital TV signal in the amplitude direction in a code differential manner;

a digital variable length encoding circuit coupled to the output of the digital signal processing circuit for generating a digital variable length output coded TV signal from the output signal of the digital signal processing circuit; and

a large-capacity digital recorder coupled to the digital variable length encoding circuit for recording the digital variable length output coded TV signals.

4,295,155

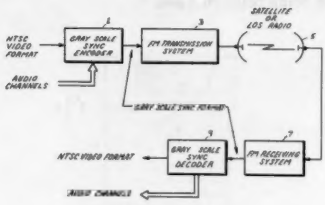
GRAY SCALE SYNC VIDEO PROCESSING SYSTEM

Harold F. Jarger, Rochelle Park, and Marvin L. Sassler, Wayne, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 8, 1979, Ser. No. 47,188

Int. Cl.³ H04J 9/32

U.S. Cl. 358—12 **39 Claims**



30. The method of processing a video signal with a picture component and a blanking component including the steps of:

eliminating the blanking component;

increasing the picture component simultaneously with said elimination step;

inserting synchronization in the video signal after the elimination step;

multiplexing audio information onto the video signal simultaneously with said synchronization step;

inserting color information into the synchronization;

placing the synchronization midway between the white and black extremities of the video signal;

reversing the polarity of alternating picture components; and

transmitting the resulting video signal.

4,295,156

METHOD FOR PRODUCING COLOR TELEVISION SIGNALS

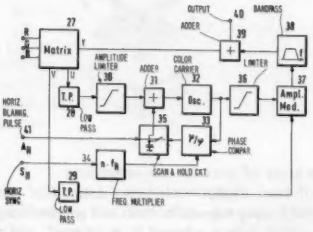
Michael Hausdörfer, Mühtal, and Jürgen Heitmann, Seeheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,478

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908273

Int. Cl.³ H04N 9/02

U.S. Cl. 358—12 **7 Claims**



1. A method of performing operations on a color television signal in a color television studio complex,

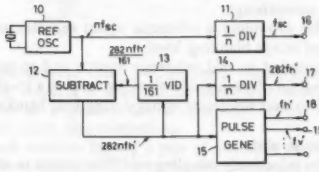
in which said color television signal is derived in analog form from a picture sensing means, said derived signal having a luminance component (Y) and a chrominance component (U, V), the chrominance component having a carrier frequency located in the upper frequency region of the luminance component,

said method comprising the steps of
converting said derived signal into a studio processing signal by
separating the chrominance component (U, V) from the luminance component (Y) to derive a chrominance component having the full-color information for the luminance component;
generating a studio carrier for the chrominance component which is outside of the frequency range of the luminance component and of higher frequency than said luminance component;
modulating said studio carrier with said chrominance component carrying the full-color information for the luminance component to form a studio chrominance signal component,
said studio chrominance signal component and said separate luminance component together forming said studio processing signal, in which said luminance component has a first frequency range and said studio carrier, modulated by the chrominance component, has a higher frequency range outside of said first frequency range;
performing said operations on the studio processing signal;
and then reconverting said studio processing signal in a form similar to that of the derived signal.

4,295,157
SIGNAL GENERATING CIRCUIT IN A COLOR TELEVISION SYSTEM

Toyotaka Machida, and Yuichi Ikemura, both of Iwai, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 23, 1979, Ser. No. 16,541
Claims priority, application Japan, Feb. 25, 1978, 53/21228
Int. Cl.³ H04N 9/44
U.S. Cl. 358—17 **10 Claims**

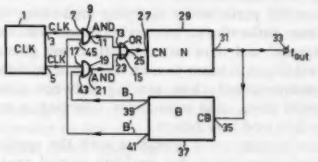


1. A signal generating circuit in a colour television system, said circuit comprising:
first means for producing a signal of a frequency of nfsc;
second means for producing a signal of a frequency of 282 nf'h;
third means for frequency-dividing to 1/161 the signal of the frequency 282 nf'h to produce a signal of a frequency 282 nf'h/161, said second means producing the signal of the frequency 282 nf'h in response to the signal of the frequency nfsc and the signal of the frequency 282 nf'h/161 so that the relationship $(282\times162)\ nf'h=161\ nfsc$ is satisfied;
fourth means for frequency-dividing to 1/n the frequency nfsc of the signal from the first means thereby to produce the PAL-system chrominance sub-carrier wave signal of a frequency fsc; and
fifth means supplied with the output signal of the second means and producing an approximational signal of the PAL-system horizontal scanning frequency and an approximational signal of the PAL-system vertical scanning frequency respectively of frequencies f'h and f'v.

4,295,158
DIGITAL FREQUENCY DIVIDER

Nico Nissen, Hamburg, Fed. Rep. of Germany; Sebastianus J. Op Het Veld, and Henri W. Schneider, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 942,470, Sep. 14, 1978, abandoned. This application Sep. 14, 1979, Ser. No. 75,472
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742184
Int. Cl.³ H04N 9/44
U.S. Cl. 358—17 **6 Claims**

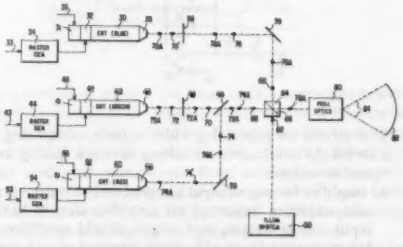


1. A digital frequency divider having a divider input for electrical input pulses and a divider output for an electrical output signal, comprising;
an N-position counter having a counter input and at least one counter output; said divider input being coupled to the counter input; said divider output being connected to said counter output;
a signal polarity switch;
a B-position auxiliary counter having an auxiliary counter input coupled to a counter output of said N-position counter;
an auxiliary counter output commanding said signal polarity switch;
a switch input coupled to said divider input;
a switch input coupled to the counter input of the N-position counter;
a delay circuit with a delay input for electrical delay pulses; said delay circuit delaying the action of said frequency divider for at least one-half period of a sequence of electrical input pulses at said divider input for each single delay pulse.

4,295,159
LIGHT PROJECTION SYSTEM

Jerome T. Carollo, and Joseph Barbarasch, both of Ormond Beach, Fla., assignors to General Electric Company, Syracuse, N.Y.

Filed Jun. 5, 1980, Ser. No. 156,685
Int. Cl.³ H04N 5/74
U.S. Cl. 358—22 **12 Claims**



1. In an electro-optical light projection system for displaying an image in which at least one selected target is portrayed in a manner differentiated from its background;
said system comprising:
at least one high resolution cathode ray tube including

means for generating an electron beam, a tube face responsive to said electron beam to provide a visible light image thereon, beam deflection means and beam intensity control means;

means for periodically applying base raster signals to said beam deflection means, said base raster signals being effective to cause said electron beam to scan through a base raster having a predetermined coarse spacing between successive base raster lines, said base raster covering at least the major portion of said tube face;

means concurrently operative with the application of said base raster signals for applying first control signals to said beam intensity control means representative of background information;

means for periodically applying mini-raster signals to said beam deflection means in alternation with said base raster signals, said mini-raster signals being effective to cause said electron beam to scan through a mini-raster having a predetermined close spacing between successive mini-raster lines, said mini-raster covering a restricted area within said base raster;

means concurrently operative with the application of said mini-raster signals for applying second control signals to said beam intensity control means representative of target information;

a source of collimated white light;

means for deriving polarized light from said collimated white light;

a liquid crystal light valve associated with said cathode ray tube and positioned to receive and reflect said polarized light, said light valve being responsive to the variable light image on said tube face modulate the polarization of the light beam reflected by said light valve;

a display screen; and

means for projecting said polarization-modulated light beam onto said display screen;

whereby a magnified, real time image is provided on said screen adapted to display said target on said mini-raster in high resolution detail, differentiated from the low resolution background displayed by said base raster.

4,295,160

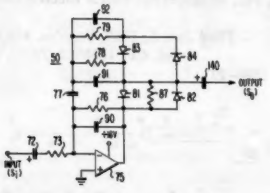
SIGNAL PROCESSING CIRCUIT HAVING A NON-LINEAR TRANSFER FUNCTION

William A. Lagoni, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 38,100, May 11, 1979, abandoned. This application Sep. 25, 1980, Ser. No. 190,722

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—31 **12 Claims**



1. A circuit for processing video signals, comprising:

a threshold conduction switching network having an input and an output;

an amplifier having an input terminal and an output terminal, said amplifier including an amplifier device having an input and an output, said output of said amplifier device being separate from said output terminal of said amplifier, with said threshold conduction switching network coupled therebetween;

a first feedback path between said output and input of said amplifier device, including a first impedance; and

a second feedback path between said output and input of said amplifier device, including a second impedance coupled between said amplifier output terminal and the input of said amplifier device, and said threshold conduction switching network having its input coupled to said output of said amplifier device and its output coupled to said output terminal; said switching network (a) exhibiting one conductive state in response to signal amplitudes of first magnitudes within a first range; and (b) exhibiting another conductive state in response to signal amplitudes of second magnitudes greater than said first magnitudes within a second range.

4,295,161

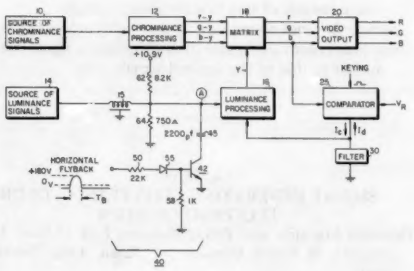
KEYED NOISE FILTER IN A TELEVISION RECEIVER

James Hettiger, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 21, 1980, Ser. No. 142,031

Int. Cl.³ H04N *9/12*

U.S. Cl. 358—34 **12 Claims**



1. In a television receiver including a video signal channel for processing an image representative video signal having periodically recurring image intervals, and image blanking intervals disposed between adjacent image intervals and containing a blanking level determinative of image brightness, apparatus comprising:

means for providing a reference signal representative of a desired image blanking level;

means coupled to said reference source and to said video channel for clamping said blanking level to a level proportional to said reference signal during said blanking intervals;

filter means; and

means for selectively coupling said filter means to said video channel prior to said clamping means during said blanking intervals to suppress high frequency signal including noise when present in said video channel, and for decoupling said filter means from said video channel during said image intervals.

12. In a color television receiver including a video signal transmission path for processing a color image representative video signal, said transmission path including a chrominance channel for processing a chrominance component of said video signal and a luminance channel for processing a luminance component of said video signal having periodically recurring image intervals and image blanking intervals disposed between adjacent image intervals and containing a blanking level determinative of image brightness, said luminance channel including signal delaying means for equalizing the signal processing transit time of said luminance channel with the signal processing transit time of said chrominance channel, apparatus comprising:

a source of reference signal;

a source of keying signals coincident with a portion of said blanking interval container said blanking level;

a comparator network responsive to said keying signals and having a first input coupled to said source of reference

signal for sensing said reference signal, a second input coupled to said video signal transmission path at a first point for sensing said blanking level, and an output for providing a control signal in response to signal difference appearing between said first and second inputs and representative of a difference in magnitude between said blanking level and said reference signal;

means for coupling said control signal to said luminance channel at a second point in said video signal transmission path prior to said first point to form a closed loop with said video signal path, for varying said blanking level in a direction to reduce said signal differences to a minimum;

filter means; and

means for selectively coupling said filter to said video signal path between said delaying means and said comparator network during said blanking intervals to suppress high frequency signals including noise when present in said video signal path, and for decoupling said filter from said video signal path during said image intervals.

4,295,162

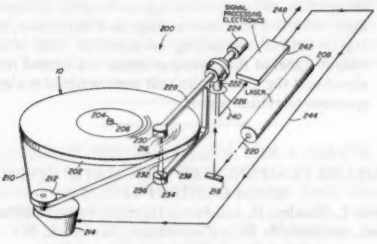
READING ONE-DIMENSIONAL LINE IMAGE HOLOGRAMS OF A VIDEO FROM A DISC WITH A GUIDE TRACK

W. John Carlsen, Natick, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 11, 1975, Ser. No. 612,381

Int. Cl.³ H04N *5/86;* **G11B** *7/12, 17/02*

U.S. Cl. 358—128.6 **42 Claims**



1. A holographic video disc playback system comprising

means for rotating a holographic video disc about a center position at a predetermined rotational speed, the holographic video disc comprising

a record medium having a pair of generally planar parallel surfaces thereon and a means for indexing a center position on the record medium so that the center positions can be made coincident,

a first spiral guiding track formed in a surface of the record medium commencing at an outward portion and continuing inwardly at a predetermined rate per revolution of the record medium, and

a second spiral track formed in a surface of the record medium in an essentially constant spatial relationship to the first spiral guiding track, the second spiral track being comprised of a continuously disposed plurality of individual holograms, each successive hologram in the second spiral track being a hologram of a one-dimensional line image containing baseband video information in the radial direction for one successive horizontal television line interval, and each individual hologram being representative of an interference pattern formed by the intersection of a data beam and a reference beam, at least one of the beams having the baseband video information for one successive horizontal television line interval modulated thereon, both beams being focussed at an image plane lying beyond and parallel to the surfaces of the record medium,

an optical system for forming and delivering a reconstruction beam of light to an area fixed in space relative to the optical system and through the continuum of holograms passes, the reconstruction beam of light generally duplicating a selected one of the data beam and the reference beam at the hologram thereby reconstructing the other one of the data beam and the reconstruction beam utilized to form the individual hologram, the reconstructed one of the data beam and the reference beam being focussed at the image plane and containing the baseband video information for the one successive horizontal television line interval,

means for detecting the baseband video information for the successive horizontal television line interval and generating a baseband video electrical signal indicative thereof, which signal may be supplied to a television receiver, the means being at least partially positioned in the image plane where the reconstructed beam components are focussed, and

means for sensing the first spiral guiding track formed in a surface of the record medium and maintaining the reconstruction beam of light in a stable relationship thereto thereby maintaining the reconstruction beam of light in a stable relationship to the second spiral track, the predetermined rotational speed being such that the plurality of individual holograms are reconstructed and detected at a rate which is compatible with the television receiver so that a complete image is formed by the television receiver in its conventional manner.

4,295,163

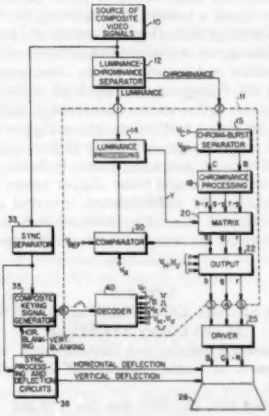
KEYING SIGNAL GENERATOR RESPONSIVE TO PLURAL INPUT SIGNALS

James Hettiger, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,933

Int. Cl.³ H04N *3/24, 5/18, 9/46, 9/535*

U.S. Cl. 358—165 **10 Claims**



1. In a television receiver for processing a composite television signal comprising an image component and a horizontal image sync component occurring during periodic horizontal image blanking intervals, said receiver including means for deriving said sync component from said television signal; means for providing timing signals coincident with said horizontal blanking intervals; and keyed signal processing circuits; apparatus for generating a keying signal, comprising:

switching means responsive to said timing signals for providing an output keying signal during said horizontal blanking intervals;

means for coupling said output keying signal to said keyed signal processing circuits;

means coupled to said sync deriving means for developing a

bias voltage with a magnitude in accordance with the average output level of said sync deriving means; and

means for coupling said bias voltage to a control input of said switching means so that said switching means responds to said bias voltage and to said timing signals.

4,295,164

CIRCUIT FOR IMPROVING PICTURE QUALITY IN A TELEVISION RECEIVER

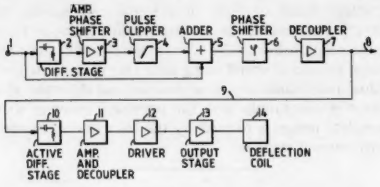
Horst Rauser, Hemmingen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 121,698

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906649

Int. Cl.³ H04N *5/63*

U.S. Cl. 358—166 **2 Claims**



1. A circuit for improving picture quality in a television receiver adapted to receive video signals, with light picture areas corresponding to a high video signal level bounded by inclined rising and falling edges, comprising, means for forming a differentiated video signal from the received video signal, means for adding the differentiated video signal to the falling edge of the received video signal in phase opposition to the received video signal, a terminal for receiving the video signal, a differentiation stage including said means for forming a differentiated video signal connected to said terminal for forming respective positive and negative pulses corresponding to the inclined rising and falling edges of the high video signal level, amplifier and phase shifter means connected to said differentiation stage for inverting said pulses, phase clipper means connected to said amplification and phase shifter means for clipping the negative pulse, and adder means including said means for adding connected to said pulse clipper means and to said terminal for adding the differentiated, inverted and clipped video signal from said pulse clipper means only to the falling edge of the received video signal from said terminal.

4,295,165

TELEVISION SIGNAL DISCRIMINATION SYSTEM IN A TELEVISION RECEIVER

Yasuaki Watanabe, Kasukabe, and Teruaki Noda, Noda, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 19, 1980, Ser. No. 122,263

Claims priority, application Japan, Feb. 19, 1979, 54-18233

Int. Cl.³ H04N *5/50*

U.S. Cl. 358—193.1 **6 Claims**

1. In a television receiver provided with an electronic tuner for producing as output an intermediate-frequency signal whose synchronizing frequency is varied in response to an applied voltage and with means for detecting the output signal of the electronic tuner, the combination therewith of a television signal discrimination system comprising:

a first synchronizing signal separation circuit supplied with the output of said detection means and separating a vertical synchronizing signal;

a first integration circuit connected to the output side of the first synchronizing signal separation circuit;

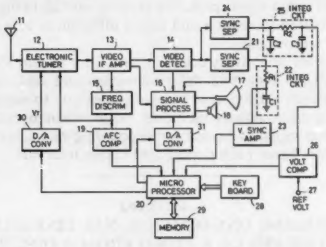
means for supplying a reference voltage;

means supplied with an output voltage of the first integration circuit and the reference voltage and operating to compare the magnitudes thereof;

a second synchronizing signal separation circuit supplied with the output of the detection means and separating a vertical synchronizing signal;

a second integration circuit connected to the output side of the second synchronizing signal separation circuit;

means for discriminating the frequency of the output of the electronic tuner; and



means for discriminating a normal television signal on the basis of the output of the voltage comparing means, the output of the second integration circuit, and the output of the frequency discriminating means,

the first synchronizing signal separation circuit and the first integration circuit producing, as output, different voltages, with the reference voltage as a borderline, depending on and distinguishing between the case where the output signal of the detection means is a normal television signal and the case where said output signal is a different spurious television signal.

4,295,166

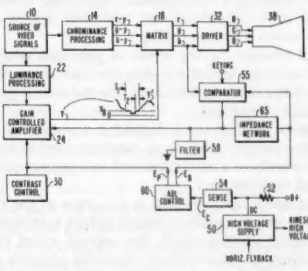
FAILURE COMPENSATED AUTOMATIC KINESCOPE BEAM CURRENT LIMITER

Robert L. Shanley, II, and James Hettiger, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 5, 1980, Ser. No. 118,855

Int. Cl.³ H04N *5/68*

U.S. Cl. 358—243 **10 Claims**



1. In a system for processing an image representative video signal, said system including a video signal processing channel; and a kinescope for reproducing an image in response to video signals applied to said kinescope from said channel; apparatus for automatically limiting excessive beam currents conducted by said kinescope above a threshold level; said apparatus comprising:

means for deriving a signal representative of the magnitude of excessive kinescope beam currents above said threshold level;

charge storage means;

control means with an input coupled to said derived signal

and an output coupled to said charge storage means via a first current conduction path, said control means normally being responsive to said derived signal for developing a proportional control signal on said charge storage means via currents conducted by said first current path in accordance with the magnitude of said derived signal in a normal control mode;

means for coupling said control signal to said video channel via a second current conduction path with a sense for modifying said video signal in a direction to limit kinescope current conduction above said threshold level in accordance with the magnitude of said control signal; and

means for modifying the charge on said charge storage means and thereby modifying said control signal and video signal to limit kinescope current conduction when excessive kinescope currents occur and normal operation of said control means is disrupted, said charge modifying means comprising

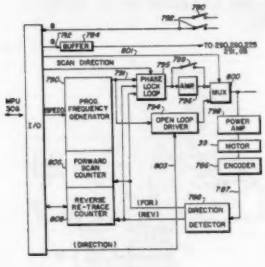
impedance means coupled to said charge storage means and to said signal deriving means, for defining an auxiliary current conduction path, independent of said first and second current paths, between said charge storage means and a circuit point exhibiting a voltage responsive to said derived signal, wherein the response of said circuit point voltage to said derived signal is such that (1) a given differential voltage relationship exists between the voltage developed on said charge storage means and the voltage at said circuit point when said control means operates in said normal control mode, thereby causing said auxiliary path to conduct a given level of current during said normal control mode, and (2) said voltage relationship changes and said current in said auxiliary path departs from said given level in response to said derived signal when excessive kinescope currents occur and normal operation of said control means is disrupted.

4,295,167

CARRIAGE SPEED CONTROL FOR A RASTER SCANNER

Douglas G. Wiggins, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 12, 1979, Ser. No. 84,203
Int. Cl.³ H04N *1/04*
U.S. Cl. 358—285 **13 Claims**



1. The method of bringing the carriage of a raster scanner to preselected scanning speed as represented by a predetermined operating frequency, the scanner including a drive motor for driving said carriage, the steps which comprise:

(a) at startup, setting a relatively low reference frequency;

(b) comparing said reference frequency with a control frequency representing velocity of said carriage;

(c) supplying power to said carriage drive motor to accelerate said carriage until said reference frequency and said control frequency are equal;

(d) incrementing said reference frequency in steps; and

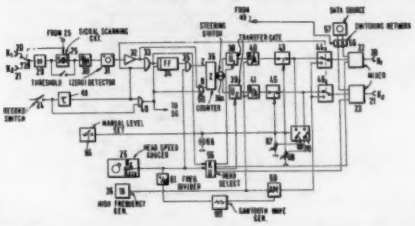
(e) for each increment in said reference frequency, repeating steps b and c until said reference frequency equals said predetermined operating frequency.

4,295,168

METHOD AND SYSTEM TO OPTIMIZE RECORDING CONDITIONS IN MAGNETIC RECORDING SYSTEMS

Rolf Müller, Seeheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 966,858
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758307
Int. Cl.³ G11B *5/47, 27/36*
U.S. Cl. 360—66 **20 Claims**



1. Method to essentially optimize recording current flow through a magnetic transducer head (**20, 21**) to obtain output signals of a desired signal level, and wherein signals are recorded on a predetermined track or track portion of magnetic tape (**1**) and the signals are thereafter read or reproduced from said track or track portion, comprising the steps of

providing a recording signal;

changing in increasing direction the signal level of the recording signal and recording said signal of increasing level on said track or track portion;

reading and reproducing the recorded signal from the track or track portion and deriving a reproduced electrical signal;

differentiating the reproduced signal with respect to the recording signal level;

and determing the recording signal level at a selected predetermined level of the differentiated signal.

4,295,169

CASSETTE LOADING AND UNLOADING DEVICE

Mitsuo Iwata; Hajime Wada; Tomoyuki Iwasa, and Kunio Tsuchino, all of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tottori Sanyo Electric Co., Ltd., Tottori, both of, Japan

Filed Oct. 19, 1979, Ser. No. 86,318
Claims priority, application Japan, Oct. 19, 1978, 53-130191
Int. Cl.³ G11B *15/66, 23/06*
U.S. Cl. 360—71 **8 Claims**

1. A cassette loading and unloading device adapted to be connected to an electric power source for loading and unloading a cassette comprising:

(a) guiding means, movable between an initial position and an inserted position, adapted to receive the cassette and guide it to an unloaded condition when moved to the initial position and to guide the cassette to a loaded condition when moved to the inserted position;

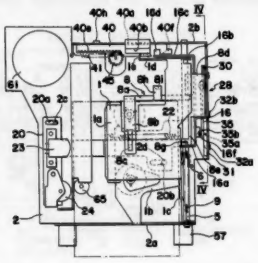
(b) first bias means for biasing the guiding means towards the initial position;

(c) an intake mechanism means operatively associated with the guiding means, and including second bias means having a greater biasing force than the first bias means for biasing the guiding means towards the inserted position, said intake mechanism adapted to forcibly draw the guiding means, when manually pushed to an intermediate

position between the initial and inserted positions, to the inserted position by the force of the second bias means;

(d) locking means, movable between a lock position and an unlock position, being moved into the lock position for restraining the guiding means in the inserted position, and being moved into the unlock position for releasing the guiding means to allow the first bias means to return the guiding means from the inserted position back to the initial position;

(e) a disabling means, operatively associated with the locking means, for disabling the intake mechanism means to disengage the second bias means from the guiding means when the locking means is moved to the lock position;



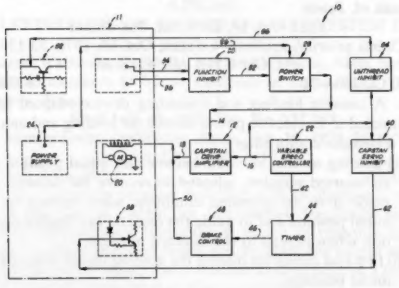
(f) actuating means, operatively associated with the locking means, adapted for connection to the electric power source for energization thereby, said actuating means being adapted to restrain the locking means in the lock position only when both the actuating means is energized by the power source and when the locking means is shifted to the lock position, whereby if the power from the power source is cut off when the cassette is in the loaded condition, the actuating means will be de-energized and cease restraining the locking means in the lock position, allowing the locking means to move from the lock position to the unlock position, and permitting the first bias means to return the guiding means back to the initial position to guide the cassette to the unloaded position.

4,295,170

VARIABLE TAPE SPEED FOR VIDEO RECORDERS

David A. Weiszbrod, Moore, Okla., assignor to Mike A. Janko, Oklahoma City, Okla.

Filed Oct. 22, 1979, Ser. No. 87,429
Int. Cl.³ G11B *15/46, 19/28*
U.S. Cl. 360—73 **11 Claims**



1. A speed control adapted for use with a video tape recorder having a play mode, a record mode, a power supply providing a power signal, a capstan motor for driving the video tape in a forward direction, a reel stop detector which provides a command signal for causing the video tape to be unthreaded and returned to a video cassette, and a capstan servo amplifier which provides an output signal to the capstan motor for preventing the capstan motor from being operated below normal speed, the video tape recorder providing an output signal indicating the video tape recorder is in the play mode of operation, the speed control comprising:

a capstan drive amplifier adapted to receive the power signal and an input control signal, the capstan drive amplifier providing an output signal connectable to the capstan motor and the speed of the capstan motor being varied in response to the variations in the capstan drive amplifier output signal, the capstan drive amplifier output signal being controllably variable in response to the input control signal;

a variable controller, having an "on" position and an "off" position, the variable controller providing the controllably variable control signal, the variable controller control signal being connected to the capstan drive amplifier for controllably varying the output signal of the capstan drive amplifier;

an unthread inhibit receiving the output signal provided by the variable controller and providing an output shunt signal in response to receiving the output signal from the variable controller, the shunt signal being connectable to the reel stop detector in the video tape recorder for preventing the reel stop detector from providing the command signal; and

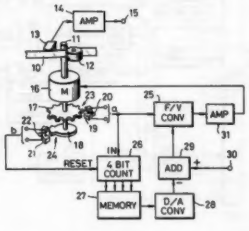
a capstan servo inhibit receiving the output control signal provided by the variable controller and providing and output disable signal in response to receiving the control signal, the output disable signal being connectable to the capstan servo amplifier in the video tape recorder to inhibit the capstan servo amplifier from providing the output signal to the capstan motor for preventing the capstan motor from operating below normal speed.

4,295,171

SYSTEM FOR CONTROLLING ROTATION OF ROTATING STRUCTURE

Akira Hirota, Chigasaki; Yoshiteru Kosaka, Kamakura, and Kazutaka Ashida, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Feb. 11, 1980, Ser. No. 120,287
Claims priority, application Japan, Feb. 13, 1979, 54-15226
Int. Cl.³ G11B *15/54, 19/28*
U.S. Cl. 360—73 **6 Claims**



1. A system for controlling the rotation of a rotating structure comprising:

means for detecting the rotation of the rotating structure;

means for repeatedly forming address signals for every revolution of the rotating structure in response to a detection output from the rotation detection means;

memory means in which control data responsive to deviations in the rotational peripheral speed of the rotating structure in each revolution thereof have been stored beforehand at addresses corresponding to said address signals, the address signals being supplied to the memory

means, whereupon the data stored at the corresponding addresses are read out; and

control means for obtaining a control signal from the detection output of the rotation detecting means and the data thus read out from the memory means and accordingly controlling the rotation of the rotating structure.

4,295,172

ROTARY MAGNETIC HEAD APPARATUS

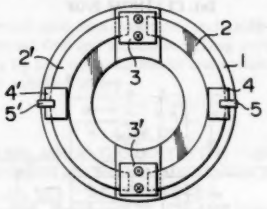
Tetsuji Fukada, Nirakata, and Yukihiko Ise, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 8, 1979, Ser. No. 92,375

Claims priority, application Japan, Nov. 10, 1978, 53-139032; Nov. 27, 1978, 53-146928; Feb. 16, 1979, 54-17379

Int. Cl.³ G11B *21/24, 5/56, 21/10*

U.S. Cl. 360—109 **7 Claims**



1. A rotary support apparatus for magnetic heads which record and reproduce signals on magnetic tape, comprising two vibrators each of said vibrators supporting one of said heads, said vibrators formed respectively by bonding together two piezoelectric vibrator elements having a hemi-ring shape, the polarization axes of said elements being in parallel with the direction of the element thickness, said vibrators operating in a bending mode, and a cylindrical rotator supporting said vibrators.

4,295,173

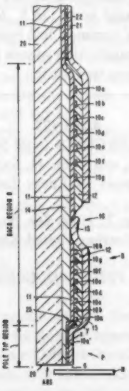
THIN FILM INDUCTIVE TRANSDUCER

Lubomyr T. Romankiw, Briarcliff Manor, and David A. Thompson, South Salem, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1979, Ser. No. 83,182

Int. Cl.³ G11B *5/12, 5/20, 5/22*

U.S. Cl. 360—125 **6 Claims**



1. A thin film inductive transducer for recording and reading magnetic transitions on a selectable one of a plurality of tracks on a magnetic recording medium, said transducer being of the type comprising two layers of a magnetic material forming a yoke structure that is activated by a conductor coil characterized in that

said yoke structure adjacent its one end comprises a pole tip region including a portion which is of a predetermined substantially constant width and a preselected substantially constant thickness, said predetermined width not exceeding the width of a track on the medium, said pole tip region extending a relatively short distance normal to the magnetic medium, thereby to maximize resolution of transitions during recording, and

said yoke structure comprises a back region which joins said pole tip region and increases in width from said predetermined width and has a back gap adjacent its wider end, the thickness of the layers of magnetic material in said back region being greater than the thickness of those layers in said portion of said pole tip region, thereby to oppose saturation of the yoke structure with applied current and enhance efficiency of the transducer by increasing the cross-sectional area of the yoke structure.

4,295,174

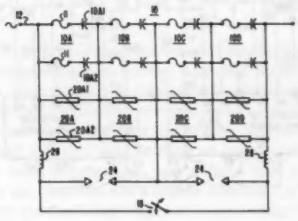
MULTI-SERIES GROUP CAPACITOR BANK PROTECTION EQUIPMENT

Charles A. Peterson, Van Buren, and Louis C. Grove, Jr., Bloomington, both of Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1979, Ser. No. 43,531

Int. Cl.³ H02H *7/16*

U.S. Cl. 361—16 **7 Claims**



1. Capacitor apparatus comprising:

a plurality of capacitor units in a bank arranged in a plurality of series groups with a plurality of units in parallel with each other within each series group;

a fuse means connected with each capacitor unit; bypass means connected across a plurality of said series groups, said bypass means having a predetermined protection level sufficient to protect said capacitor units against transients to which said bank is subjected; and

voltage limiter means connected individually across each of said series groups and having a predetermined protection level higher than that of said bypass means, said voltage limiter means operable to temporarily bypass a series group upon one of said fuse means of one of said units clearing due to conditions not affecting said bypass means.

4,295,175

PILOT WIRE RELAY PROTECTION SYSTEM FOR ELECTRICAL DISTRIBUTION NETWORKS

Daniel E. Cordray, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Apr. 21, 1980, Ser. No. 142,512

Int. Cl.³ H02H *7/26*

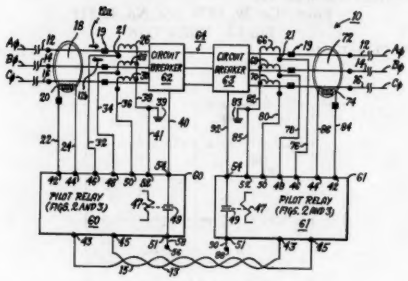
U.S. Cl. 361—69 **13 Claims**

1. A pilot wire relay protection system for protecting a section of a high voltage network located between first and second circuit breakers and comprising at least a first and a

second transmission line each constituting a phase of said network, said pilot wire relay protection system detecting and responding to phase-to-phase faults, phase-ground faults and phase-phase-ground faults that may occur within the protected section by detecting and responding to an excessive differential current existing between a first and a second end of said protected section, said pilot wire relay protection system comprises:

a plurality of current sensors each coupled to a transmission line and arranged into a first group located at the first end of said protected section for respectively developing coupled currents representative of the transmission-line currents flowing at said first end of said protected section and a second group located at the second end of said protected section for respectively developing coupled currents representative of currents flowing at the second end of said protected section;

said first and second groups of current sensors having at least a first, a second, and a third current sensor respectively coupled to the first, the second, and the combination of the first and second transmission lines, said third current sensor developing a coupled current representative of the sum of currents flowing within the first and the second transmission lines at said third current sensors, so that upon the occurrence of a phase to phase fault within said protected section causing a relatively high current to flow within said protected section, said coupled current from the third current sensor will be representative of the difference between the transmission-line currents at said third current sensor flowing toward and away from the location of the fault, and such that the coupled current from the third current sensor will be substantially unchanged by the relatively high current flowing within either of the transmission lines of said protected section during the phase to phase fault, whereby said third current sensors remain unaffected by said phase-phase fault and thus able to provide a coupled current representative of the currents flowing within said transmission lines upon a simultaneous or subsequent occurrence of a phase-ground fault within said protected section;



each of said first, second, and third current sensors having a first and a second terminal, said first and said second current sensors of each group further having their second terminal connected together;

a first pilot relay coupled to said first and second terminals of each of the current sensors of said first group;

a second pilot relay coupled to said first and second terminals of each of the current sensors of said second group;

each of said pilot relays being responsive to coupled current from its associated current sensors for generating a first output signal representative of the composite of the current coupled from its associated first, second, and third current sensors;

pilot wire means comprising first and second conductors for coupling said first output signals together;

each of said first and said second pilot relays having further means for generating a second output signal if the current flowing within said first and said second conductors and the voltage difference between said first and said second conductor exceed predetermined limits; and

means adapted to couple said second output signal of said first and said second pilot relays to said first and said second circuit breakers for causing said circuit breakers to disconnect the protected section from the remainder of the power network if the differential current between said first and said second ends of said protected section exceeds a predetermined limit.

4,295,176

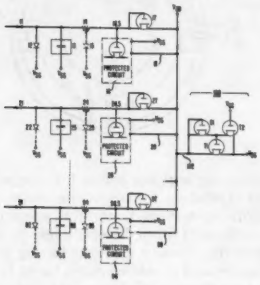
SEMICONDUCTOR INTEGRATED CIRCUIT PROTECTION ARRANGEMENT

Norman C. Wittwer, Oldwick, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 4, 1979, Ser. No. 72,139

Int. Cl.³ H02H *9/04*

U.S. Cl. 361—91 **8 Claims**



1. Semiconductor apparatus comprising an overvoltage protection arrangement for a multiplicity of MOSFET circuits (**16, 26,** . . . **96**) integrated in a single semiconductor body at a first major surface thereof, characterized by means for connecting a node (**16.5, 26.5,** . . . **96.5**) of each of said circuits through the high current path of an auxiliary transistor, (T_1), integrated in said semiconductor body to an electrode in wide area contact with a second opposed major surface of said body, and with a common reference voltage metalization line (**101**) connected (**18, 28,** . . . **98**) to each said circuit for providing the reference voltage thereto, said means including a separate unidirectional current inhibiting device (**17, 27,** . . . **97**) connected between each said node (**16.5, 26.5,** . . . **96.5**) and the common line (**101**), the common line being connected through bidirectional current conducting means (**102**) to the high current path of the auxiliary transistor.

4,295,177

CONTROL CIRCUITS FOR SOLENOIDS

Richard G. Woodhouse, and Peter H. Salway, both of Birmingham, England, assignors to Lucas Industries Limited, Birmingham, England

Filed Aug. 7, 1979, Ser. No. 64,644

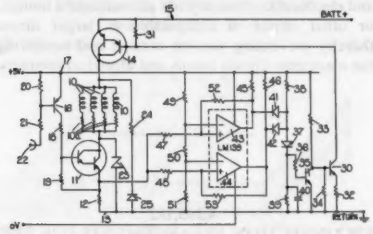
Claims priority, application United Kingdom, Aug. 24, 1978, 34442/78

Int. Cl.³ F02D *5/02;* **G05B** *11/01*

U.S. Cl. 361—154 **7 Claims**

1. A solenoid control circuit comprising semi-conductor switch means and a current sensing element in series with the solenoid between a pair of supply terminals, initiating means for turning on said switch means to initiate current flow in the solenoid, first means sensitive to said current sensing element for turning off said switch means when the solenoid current reaches a first predetermined level and second means sensitive to said current sensing element for turning the switch means on

and off to maintain the solenoid current at a second predetermined level lower than said first predetermined level, said second means sensitive to said current sensing element initially being overridden by said first means sensitive to the current



sensing element, said semi-conductor switching means including two separate first and second switching devices controlled respectively by said initiating means and by said first and second current sensitive means.

4,295,178

ELECTRODE ARRANGEMENT WITH INDIVIDUALLY CONNECTABLE AND DISCONNECTABLE ELECTRODES

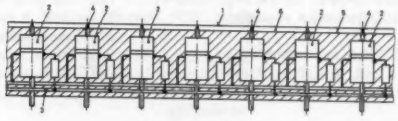
Walter Spengler, Strehlgasse 23, CH-4105 Biel-Benken, Switzerland

Filed Dec. 10, 1979, Ser. No. 101,642

Claims priority, application Switzerland, Feb. 21, 1979, 1709/79

Int. Cl.³ H01T *19/04*

U.S. Cl. 361—220 **19 Claims**



1. In an electrode arrangement for applying or removing an electrostatic charge to or from a surface and comprising a plurality of electrodes adapted to apply to or receive from the surface an electrostatic charge, and insulating body means mounting the plurality of electrodes in a predetermined arrangement for positioning in operative association with the surface to which the charge is to be applied or from which the charge is to be removed, the improvement in said arrangement in which each of said electrodes comprises

an electrode point carried by said insulating body means and projecting outwardly therefrom and adapted to be positioned adjacent said surface,

contact means carried by said insulating body means in spaced relation to said electrode point and adapted to be connected to an electrical supply source or to ground, and

connecting means carried by said insulating body means for selectively connecting and disconnecting said electrode point and said contact means, said connecting means comprising an electrically conductive bridging member electrically connected to one of said electrode point and said contact means and mounted for movement between an active position in which said bridging member is in electrical contact with the other of said electrode point and said contact means to bridge the space therebetween and to provide for the flow of an electrical current therebetween and an inactive position in which said bridging member is spaced from the other of said electrode point and said contact means, means operably associated with said bridging member for selectively moving said bridging member between said active and inactive positions, and displaceable insulating means positioned in the path of travel of said bridging member from said inactive position to said active position for insulating said bridging member from the other of said electrode point and said contact means when said bridging member is in said inactive position while permitting movement of said bridging member to said active position.

4,295,179

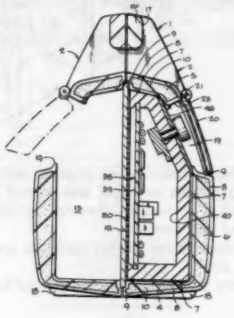
ELECTRIC TEST EQUIPMENT HOUSING

Clifford D. Read, Almonte, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Dec. 18, 1979, Ser. No. 104,869

Int. Cl.³ H05K *5/06*

U.S. Cl. 361—331 **12 Claims**



1. A housing for electrical or electronic test equipment made from waterproof material, having inner and outer skin layers which are relatively resiliently movable upon application of pressure, defining a chamber for containing electrical or electronic test set equipment and comprising a closed top, two sidewalls and a base, a rear defining an opening to admit the equipment into the chamber, and a front wall defining an aperture to the chamber, and a flap on said housing for closing the aperture, the flap being hinged at an upper edge for upward hinging movement away from the aperture.

4,295,180

WALL MOUNTABLE HOUSING FOR PROGRAMMABLE THERMOSTAT

Clifford W. Herron, 717 Via Bravo, Mesquite, Tex. 75150, and Robert J. Wunderlich, 961 Easton Pl., Dallas, Tex. 75218

Filed Jun. 4, 1980, Ser. No. 156,401

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—383 **4 Claims**

1. A wall mountable housing having multiple members which, together, enclose the electronic components of a programmable thermostat having switching controls, keyboard, and display elements, said housing comprising:

a generally rectangular rear panel comprising: means for attaching said rear panel to said wall;

at least one aperture whereby control wires pass through the rear panel and into said housing;

a first hinge element at an edge of said panel; and

first detent dagger means whereby the rear panel is attachable to another housing member;

second detent dagger means whereby the electronic components are connectable to a housing member;

a generally rectangular face plate comprising:

third detent dagger means whereby the face plate is connectable to a housing member;

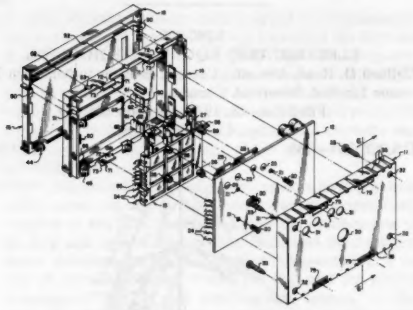
an aperture whereby the switching controls and display elements are accessible;

an aperture whereby the display elements are viewable; and

a second hinge element at an edge of said face plate;

a door whereby switching controls and keyboard of the programmable thermostat are protected, said door comprising:

latching means; and



a third hinge element at an edge of said door whereby, interacting with said first and second hinge elements, the door is pivotally connected to the attached face plate and rear panel;

a window whereby the display elements are protected and viewable; and

vents whereby air circulates through said housing.

4,295,181

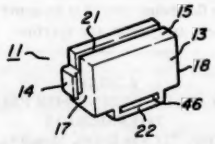
MODULE FOR AN INTEGRATED CIRCUIT SYSTEM

Richard R. Chang, Richardson; Gene A. Frantz, and William R. Hawkins, both of Lubbock, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 15, 1979, Ser. No. 3,449

Int. Cl.³ H05K *7/10*

U.S. Cl. 361—395 **9 Claims**



1. A modular electronic device comprising:

(a) housing means of an insulative material defining an internal chamber, said housing means including parallel planar first and second major surfaces, side walls and end walls;

(b) one of said side walls having an elongated slot of predetermined width extending inwardly along the entire length of the side wall and along adjacent portions of the end walls and communicating with the internal chamber defined by said housing means;

(c) a side wall oppositely positioned from said elongated slot including an integral projection extending therefrom with an outwardly opening recess for receiving an implement to facilitate removal of said housing means from an installed position within an electronic apparatus; and

(d) electronic device means mounted within the internal chamber of said housing means and completely enclosed thereby, said electronic device means including electronic circuit means and a plurality of electrical contacts connected to said electronic circuit means for coupling said electronic circuit means to an external apparatus, said contacts being disposed in substantial alignment with the slot in said side wall of said housing means, said electronic circuit means and said plurality of electrical contacts being accessible from the exterior of said housing means only via the slot in said side wall, the width of said slot being sufficiently small so that the electronic circuit means and electrical contacts are not accessible to a human finger or other object of comparable or larger dimensions, thereby preventing wanton contact and tampering with the electronic circuit means and electrical contacts.

4,295,182

INTERCONNECTION ARRANGEMENTS FOR TESTING MICROELECTRONIC CIRCUIT CHIPS ON A WAFER

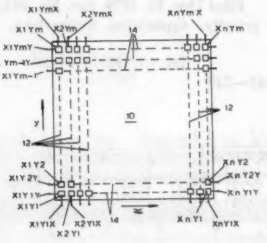
Russell C. Aubusson, Broxbourne, and Richard J. Gledhill, London, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 948,195, Oct. 2, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,035

Claims priority, application United Kingdom, Oct. 3, 1977, 40896/77

Int. Cl.³ H01L *27/00*

U.S. Cl. 361—400 **6 Claims**



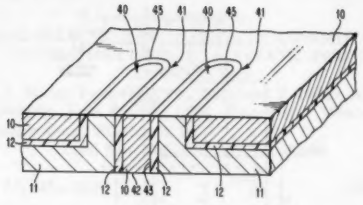
1. In a circuit configuration for use in testing microelectronic circuit chips, said circuit configuration being of the type comprising a flat wafer having non-adjacent opposite physical edges and thereon within the region bounded by said physical edges oo, said wafer surface having thereon an array of microelectronic circuit chips to be tested, each of the chips on said wafer comprising a digital circuit which processes digital information and to transfer digital information and control signals from a set of input connections on the chip to one of a plurality of sets of output connections on the chip selected by a switching circuit within the digital circuit, each set of output connections being connected to input connections of an adjacent chip on said wafer in accordance with the operation of the switching circuit thereby to set up a chain of interconnected sound chips in said array or said surface on said wafer which extends from a selected sound first chip and which bypasses faulty chips on said wafer, the improvement wherein said circuit configuration includes electrical connections which directly connect an output connection of each chip immediately adjacent a first physical edge of the said flat wafer to the input connection of a different chip adjacent a second physical edge of the said flat wafer whereby all chips behave electrically as though the surface of said flat wafer were unbounded in a direction transverse to said first and second edges and whereby the said selected first chip in said chain of interconnected chips is located immediately adjacent one of the physical edges of said flat wafer.

4,295,183

THIN FILM METAL PACKAGE FOR LSI CHIPS

Ekkehard F. Miersch, Boeblingen, Fed. Rep. of Germany, and Lubomyr T. Romankiw, Briarcliff Manor, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,497
Int. Cl.³ H05K *1/16*
U.S. Cl. 361—403 **7 Claims**



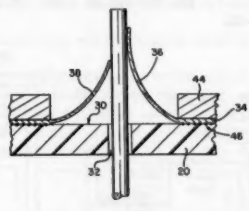
1. In an electronic chip carrier, a substrate with pad areas thereon for connection to a thin film, integrated circuit chip, a said chip connected to said pad areas, said substrate including a plurality of conductors coupled to said pad areas for electrical connection of said pads to various points, the improvement comprising connecting means for said chip to said pad areas by means of connections on the base of said chip, said conductors comprising a plurality of parallel conductive planar metallic sheets having large parallel surfaces with a layer of high dielectric material between adjacent ones of said sheets for providing high electrical capacitance and minimal inductive coupling therebetween, and at least one of said pads extending through at least one of said planar metallic sheets, each said pad being electrically insulated from said sheets through which it passes.

4,295,184

CIRCUIT BOARD WITH SELF-LOCKING TERMINALS

Joseph A. Roberts, Hudson, N.H., assignor to Advanced Circuit Technology, Nashua, N.H.

Division of Ser. No. 934,702, Aug. 21, 1978, Pat. No. 4,223,435, which is a continuation-in-part of Ser. No. 808,808, Jun. 22, 1977, Pat. No. 4,107,836. This application Apr. 4, 1980, Ser. No. 137,449
Int. Cl.³ H05K *1/18*
U.S. Cl. 361—406 **11 Claims**



1. A circuit board comprising in combination:

a rigid dielectric carrier panel, said carrier panel having at least one aperture formed between opposite surfaces thereof;

at least one electrically conductive circuit formed of a resiliently flexible metal, secured at least in part to said dielectric carrier panel, said electrically conductive circuit having (i) at least one integral termination which essentially surrounds said at least one aperture in said panel, said termination including (ii) a pair of dissimilar size generally L-shaped fingers disposed inwardly for a distance from the edge of said aperture:

said termination including a frame section of cross-sectional thickness greater than the cross-sectional thickness of said electrically conductive circuit and a shoulder section of reduced cross-section thickness as compared with said frame section, said shoulder section having a plan area greater than that of said at least one aperture, said shoulder being secured to said dielectric panel at least in part; and

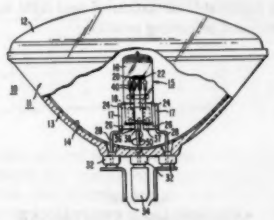
a dielectric material covering said conductive circuit patterns at least in part and secured to said dielectric panel, said dielectric material having (i) at least one aperture substantially corresponding in position to said at least one termination and (ii) overlaying and secured at least in part to said termination shoulder area.

4,295,185

FILAMENT MOUNT ASSEMBLY FOR MINIATURE INCANDESCENT LAMP, AND METHOD OF MANUFACTURE

Jack Martin, Paramus, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 26, 1979, Ser. No. 79,150
Int. Cl.³ F21M *3/30*
U.S. Cl. 362—211 **10 Claims**



1. An electric incandescent lamp comprising;

a sealed light-transmitting envelope containing a refractory wire filament having a coiled body portion that is terminated at each end by an uncoiled leg,

a pair of substantially rigid lead-in conductors extending into said envelope and having end segments that are disposed in abutting end-to-end relationship with the respective legs of the filament and form therewith a pair of filament-conductor junctures, and

means electrically and mechanically coupling the filament legs to the associated abutting end segments of the lead-in conductors comprising a pair of sleeve-like members of stiff electrically-conductive material that are disposed in overlying bridging relationship with the respective filament-conductor junctures, said sleeve-like coupling members being fastened to the abutted parts of the filament legs and lead-in conductors in overlapped engagement therewith and thereby securely locking the filament and lead-in conductors in operative relationship.

4,295,186

SLIT ILLUMINATING DEVICE

Muneharu Sugiura, Tokyo, and Seiji Sagara, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

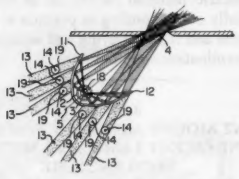
Continuation-in-part of Ser. No. 948,399, Oct. 4, 1978, abandoned. This application Oct. 26, 1978, Ser. No. 954,760
Claims priority, application Japan, Oct. 12, 1977, 52-122172
Int. Cl.³ F21V *7/12*; G03B *27/54*
U.S. Cl. 362—217 **3 Claims**

1. A slit illuminating device for an image reproduction apparatus, which comprises:

(a) an original support table having a slit portion for slit illumination of an original;

(b) a tubular shaped light source arranged with its longitudinal axis spaced a predetermined distance from and parallel to a reference line which extends along the length of said slit; and

(c) a multi-surfaced mirror partially surrounding said light source and comprising a plurality of planar mirrors provided on both sides of a plane defined by the longitudinal axis of said light source and the reference line, wherein the respective length of each planar mirror, when viewed in cross-section defined by a plane perpendicular to the



reference line, is such that it transmits an effective bundle of light, as if emitted from a corresponding enlarged virtual image of said light source, to said slit portion, the size of the enlarged image being determined in accordance with an acceptable deviation of said light source from a predetermined mounting position.

4,295,187

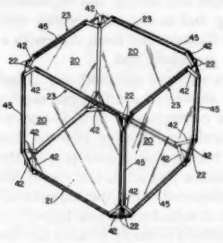
ASSEMBLABLE CONTAINER

Norman S. Shemitz, Milford, Conn., assignor to Shem Safe Incorporated, Milford, Conn.

Continuation-in-part of Ser. No. 950,592, Oct. 12, 1978, Pat. No. 4,233,656. This application Feb. 27, 1980, Ser. No. 125,168

Int. Cl.³ F21V *1/06*

U.S. Cl. 362—352 **13 Claims**



1. A support system for a container having a plurality of panels forming at least the sides and bottom of the container and connected together by the support system in a predetermined polyhedral configuration, each of the panels defining a plurality of corners; comprising, a plurality of collars, each collar being adapted to extend around a corresponding one of the panel corners, elastic connecting members connecting at least some of the collars together such that groups of opposing, adjacent collars on juxtaposed panels are connected together at their proximate ends by a said elastic member, and at least some of the said groups of collars are connected to other groups of collars which are spaced from the first said group by tensioned elastic members stretched between the said groups of collars, such that all of the collars are capable of being releasably held in place on their respective panels, to releasably hold all of the panels under the tension of the elastic members in the predetermined polyhedral configuration.

4,295,188

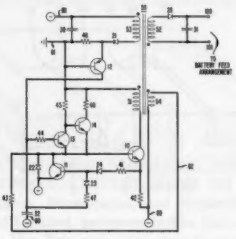
CONVERTER CIRCUIT PROVIDING ISOLATION AND LOAD SENSING

James E. Brunssen, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 13, 1979, Ser. No. 103,271

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—21 **9 Claims**



1. A blocking oscillator converter comprising a transformer having: a primary winding circuit for connecting a DC source to current switching means; a secondary winding circuit for supplying a load; a tertiary winding circuit for regulating the voltage delivered to said load; and a drive winding circuit for operating said switching means

characterized by

means in said tertiary circuit for sensing current diverted from said secondary circuit and returned to said source, and

means, coupled to said means for sensing, for controlling the operation of said switching means in response to said current.

4,295,189

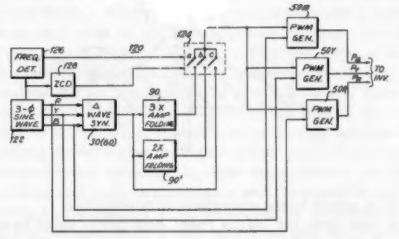
APPARATUS AND METHOD FOR GENERATING WAVEFORMS WHICH ARE PARTICULARLY SUITABLE FOR A PWM-DRIVEN MOTOR

John T. Boys, Auckland, New Zealand, assignor to The University of Auckland, Auckland, New Zealand

Filed Dec. 4, 1979. Ser. No. 99,998

Int. Cl.³ H02M *1/08*

U.S. Cl. 363—41 **32 Claims**



14. Apparatus for generating an n-phase pulse width modulated (PWM) waveform particularly adapted for energizing an n-phase electrical motor, wherein n is an integer, said apparatus comprising a source of n-phase sine wave signal, each phase having a fundamental frequency f, triangle waveform generating means for generating a triangle waveform of frequency mf from said n-phase sine wave signal wherein m is an integer, said triangle waveform having substantially linearly sloped, gradually increasing and decreasing edges, said triangle waveform generating means including detecting means for detecting when a segment of any of said n phases of said sine wave signal

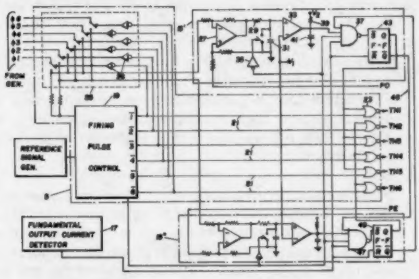
is within a predetermined angular amount from a reference crossing level, and selecting means for selecting successive ones of said detected segments to synthesize said triangle waveform; and n comparing means, a respective comparing means being provided for each phase for comparing said triangle waveform to an associated phase of said sine wave signal to produce a pulse transition at each intersection of said triangle waveform and said associated phase of said sine wave.

4,295,190

BANK SELECTION IN NATURALLY COMMUTATED THYRISTOR CONTROLLED STATIC POWER CONVERTERS

Eric J. Stacey, Penn Hills, Pa., and Donal E. Baker, American Township, Lima County, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 19, 1979, Ser. No. 95,899
Int. Cl.³ H02M *5/27*
U.S. Cl. 363—162 **13 Claims**



4. A converter for generating from a multiphase AC voltage source a desired output waveform to be applied to a load, said converter comprising:

a naturally commutated power circuit including a plurality of thyristors arranged in positive and negative banks inserted between the AC voltage source and the load, the thyristors in each thyristor bank being arranged in pulse groups interconnected by interphase transformers;

control means for firing said thyristors sequentially to generate said desired output waveform which is applied to said load;

means for determining which thyristor bank is carrying the load current;

means for determining when the current in each pulse group of the nonload current carrying bank goes to zero; and

means for inhibiting the firing of thyristors in each pulse group of the nonload current carry bank in response to zero current therethrough.

4,295,191

PROGRAMMABLE CONTROL SYSTEM

Worley C. Wilson, Ft. Lauderdale, Fla., assignor to Telemetry Controls, Inc., Miami, Fla.

Filed Feb. 14, 1980, Ser. No. 121,446
Int. Cl.³ G05B *19/04*; H01H *43/00*
U.S. Cl. 364—104 **6 Claims**

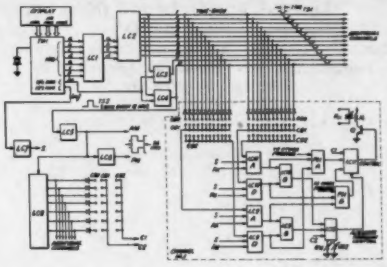
1. An electronic programmable system for controlling the operation of remotely located equipment comprising:

(a) time base generating means including means for cyclically providing a plurality of output timing signals corresponding to a predetermined number of equally spaced-apart points of a preselected time base;

(b) controllable data transfer means including first data transfer means and second data transfer means;

(c) programmable connection means including a plurality of controllable circuit paths operatively connected between said time base generating means and said first data transfer means and a plurality of controllable circuit paths operatively connected between said time base generating means and said second data transfer means, said programmable connection means including user-accessible panel means for receiving insertable program pins which effect actuation of selected ones of said controllable circuit paths thereby coupling selected ones of said output timing signals to said first data transfer means and to said second data transfer means;

(d) data transfer control means for selectively enabling said controllable data transfer means, said data transfer control means including means for generating a first data transfer control signal, a second data transfer control signal and a strobe signal, wherein said first data transfer control signal is coupled to said first data transfer means and said second



data transfer control signal is coupled to said second data transfer means and said strobe signal is coupled to said first and second data transfer means, said first data transfer means being enabled when said first data transfer control signal, said strobe signal and one of said coupled output timing signals are coincidently applied to said first data transfer means, said second data transfer means being enabled when said second data transfer control signal, said strobe signal and one of said coupled output signals are coincidently applied to said second data transfer means; and

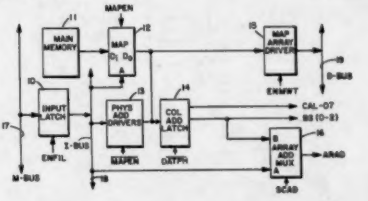
(e) programmable switching means operatively connected to said controllable data transfer means and responsive to said transferred output timing signals including means for generating a switching control signal for controlling the operation of said remotely located equipment.

4,295,192

ROW ADDRESS MEMORY MAP OVERLAP

Brewster J. Porcella, Tustin, Calif., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 13, 1979, Ser. No. 29,697
Int. Cl.³ G11C *13/00*
U.S. Cl. 364—200 **16 Claims**



1. A memory mapping apparatus comprising,

a source of original address information wherein said original address information is comprised of a specified number of bits;

memory map means connected to receive a first portion of said original address information directly from said source;

multiplexer means connected to receive a different portion of said original address information directly from said source;

memory means connected to said memory map means to concurrently supply memory information directly to said memory map means; and

means connected between said memory map means and said multiplexer means and operative to supply map information to said multiplexer means from said memory map means,

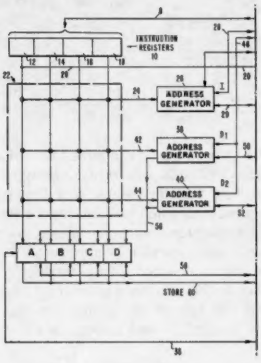
said multiplexer means providing new address information representative of said map information and said different portion of said original address information wherein said new address information includes mapped information from said memory via said memory map means.

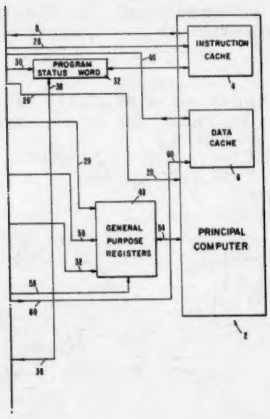
4,295,193

MACHINE FOR MULTIPLE INSTRUCTION EXECUTION

James H. Pomerene, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,567
Int. Cl.³ G06F *7/00*
U.S. Cl. 364—200 **6 Claims**





6. In apparatus for computing instructions of a given type compiled into groups of n, where n is an integer ≧4, instructions, with no more than one instruction being other than said given type and said one instruction being at a fixed position from one group to the next, with two data fetches and one branch instruction fetch and one store operation being permitted in a group, with any branch instruction fetch being the last instruction in the group, the combination comprising:

an instruction cache wherein said groups of n instructions including branch instructions are stored;

a data cache containing data necessary to perform said instructions;

an n stage register in which a group of n instructions at a time is stored from said instruction cache, with any instruction other than said given type being stored in a predetermined one of said n stages;

a first gating means responsive to the instruction stored in said predetermined one of said n stages for determining if the instruction is of said given type, and if so permitting same to be processed by said apparatus;

a second gating means responsive to each of said n instructions for determining which instructions, if any, contains a branch instruction fetch;

a third gating means responsive to each of said n instructions for determining which instruction, if any, contains a first data fetch;

a fourth gating means responsive to each of said n instructions for determining which instruction, if any, contains a second data fetch;

a group of general purpose registers in which addresses and data needed for executing said instructions are stored;

an instruction address generation means operative with said general purpose registers and responsive to said second gating means for initiating a branch instruction fetch from said instruction cache;

a first data address generation means operative with said data cache and general purpose registers and responsive to said third gating means for fetching addresses and data;

a second data address generation means operative with said data cache and general purpose registers and responsive to said fourth gating means for fetching addresses and data; and

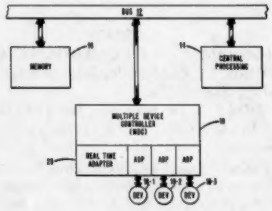
n execution logic means, each operative with one of said n stages of said n stage register and said first and second data and address generators for concurrently executing the called for valid instructions of said given type including called for data fetches and store operations, if any, with the address and data called for by said store operation being provided to said data cache.

4,295,194

ADAPTER UNIT FOR USE IN A DATA PROCESSING SYSTEM FOR PROCESSING A VARIETY OF REQUESTS

Boyd E. Darden, St. Petersburg, Fla., and Henry F. Hartley, Lowell, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 6, 1979, Ser. No. 73,056
Int. Cl.³ G06F *9/46*
U.S. Cl. 364—200 **31 Claims**



1. A data processing system including a central processing unit and a controller coupled in common to a bus, said controller having a number of ports connected to a corresponding number of adapter units, one of said adapter units comprising:

a data bus;

an address bus;

microprocessing means coupled to receive task word commands from said controller coded to specify a number of time of day operations and including time of day information signals, said microprocessing means being coupled to said data and address buses;

random access memory means coupled to said data and address buses, said memory means being organized into a plurality of sections, each section having a plurality of locations, a first section corresponding to a first buffer, a second section corresponding to a second buffer, a third section corresponding to a third buffer and a fourth section corresponding to a timer control section;

a programmable read only memory means coupled to said data and address buses, said read only memory means including a plurality of locations for storing a plurality of timer control sequences for processing different ones of said commands;

free running time of day means for generating and storing time of day values, said time of day means being coupled to said data bus and operatively coupled to said address bus; and,

timer module means coupled to said microprocessing means and to said data and address buses, said module means including a number of programmable cyclic timer circuits, each timer circuit including control and counter registers operatively coupled to said address and data buses;

said microprocessing means being operative in response to one of said task commands to reference a first predetermined one of said plurality of timer control sequences for generating signals to load predetermined time of day information signals received from said controller required for executing the time of day operation specified by said command into a selected one of said buffers and for generating signals on said address and data bus lines for loading said timer control and counter registers of one of said timer circuits with control signals read out from said fourth section specifying a timer mode of operation and a predetermined time interval in accordance with said one command, said timer module means being conditioned by said control signals to generate an interrupt at the end of said predetermined time interval to said microprocessing means for detecting the completion of the time of day operation specified by said one command.

4,295,195

RADIOGRAPHY

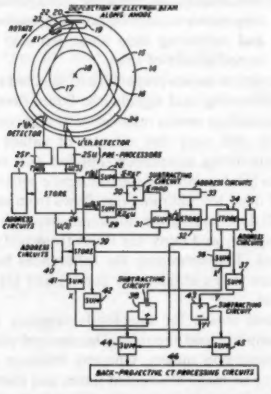
Godfrey N. Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Filed Oct. 24, 1979, Ser. No. 87,669

Claims priority, application United Kingdom, Oct. 24, 1978, 41710/78

Int. Cl.³ G06F *15/42*; G01N *23/00*

U.S. Cl. 364—414 **3 Claims**



1. A CT scanner including a source of a substantially planar, divergent spread of penetrating radiation, the radiation propagating across a patient position, detector means sensitive to the radiation and disposed to receive the radiation emergent from said patient position; the detector means including a plurality of detector devices arranged to receive radiation element from said patient position along respective, substantially linear paths and to generate respective electrical output signals indicative of the amounts of radiation so received, scanning means causing said source and said detector means to move angularly around the patient position about a common axis of rotation with the spread of radiation remaining in a plane intersected substantially orthogonally by said axis, and processing means for operating upon output signals generated by said detector means throughout the angular movement to generate a representation of the variation of attenuation of said radiation from place to place over said patient position and in the said plane; the scanning permitting said detector means to generate output signals relating to many sets of paths distributed across the patient position, each set being disposed at a respective attitude to the patient position and consisting of several sub-sets of paths, the radiation propagating along each path of any given sub-set being received by a respective detector device and that propagating along the paths of other sub-sets of the same set being received by different detectors; overlap zones existing between each pair of adjacent sub-sets wherein any two detector devices associated with the paths included in adjacent sub-sets receive radiation along several common paths, the processing means including components operating upon the respective signals generated by the two detector devices in respect of said common paths to generate a respective normalized signal, containing contributions from both detectors, in respect of each of said common paths; each of said normalized signals being generated by comparing output signals relating to different numbers of the paths in the overlap zone for common paths at different positions within the overlap zone, the number of paths involved in the comparison varying, across the overlap zone, from a minimum for common paths at one edge thereof through a maximum in the center thereof to a minimum at the other edge thereof.

4,295,196

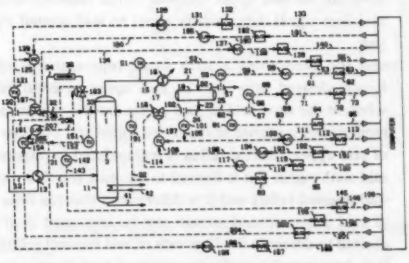
FRACTIONAL DISTILLATION COLUMN CONTROL

Danny L. Furr, Broken Arrow, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 2, 1980, Ser. No. 165,463

Int. Cl.³ E01D *3/42*

U.S. Cl. 364—501 **3 Claims**



1. Apparatus comprising:

a fractional distillation column means;

a first heat exchanger means;

means for supplying a feed stream through said first heat exchanger means to said fractional distillation column means;

means for withdrawing a pump around stream from a first upper portion of said fractional distillation column means and for passing said pump around stream through said first heat exchange means to a second upper portion of said

fractional distillation column means, wherein said second upper portion is above said first upper portion;

a first cooling means;

an overhead accumulator means;

means for withdrawing an overhead vapor stream from an upper portion of said fractional distillation column means and for passing said overhead vapor stream through said first cooling means to said overhead accumulator means;

means for withdrawing a liquid stream from said overhead accumulator means, for returning the first portion of the thus withdrawn liquid stream to a third upper portion of said fractional distillation column means as an upper external reflux, and for removing a second portion of the thus withdrawn liquid stream as a product stream, wherein said third upper portion is above said first upper portion;

means for manipulating the flow rate of said pump around stream;

means for manipulating the flow rate of said upper external reflux;

means for calculating a first signal representative of the actual flow rate of the internal reflux in an upper portion of said fractional distillation column means;

means for calculating a second signal representative of the flow rate of the internal reflux in the upper portion of said fractional distillation column means required to maintain a desired product specification for said product stream;

means for comparing said first signal and said second signal to thereby determine if the internal reflux flow rate in the upper portion of said fractional distillation column means should be increased or decreased;

means for determining if the flow rate of said pump around stream can be increased;

means for determining if the flow rate of said upper external reflux can be decreased;

means for calculating a third signal representative of the flow rate of said pump around stream required to make said first signal substantially equal to said second signal;

means for establishing a fourth signal representative of the highest desired flow rate of said pump around stream;

means for establishing a fifth signal representative of the flow rate of said upper external reflux required to make said first signal substantially equal to said second signal; and

means for establishing a sixth signal representative of the lowest desired flow rate of said upper external reflux, wherein the flow rate of said pump around stream is manipulated in response to said third signal and the flow rate of said upper external reflux is manipulated in response to said sixth signal if it is desired to increase the flow rate of said internal reflux and it is determined that the flow rate of said pump around stream can be increased or if it is desired to decrease the flow rate of said internal reflux and it is determined that the flow rate of said upper external reflux cannot be decreased, and wherein the flow rate of said pump around stream is manipulated in response to said fourth signal and the flow rate of said upper external reflux is manipulated in response to said fifth signal if it is desired to increase the flow rate of said internal reflux and it is determined that the flow rate of said pump around stream cannot be increased, or if it is desired to decrease the flow rate of said internal reflux and it is determined that the flow rate of said upper external reflux can be decreased.

4,295,197

INFILTRATION-INFLOW SEWER LINE ANALYZER

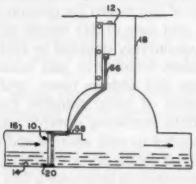
Peter D. Petroff, 4102 Piedmont Dr., Huntsville, Ala. 35802

Division of Ser. No. 905,196, May 12, 1978, Pat. No. 4,211,111, which is a division of Ser. No. 811,557, Jun. 30, 1977, Pat. No. 4,116,061, which is a division of Ser. No. 602,974, Aug. 8, 1975, Pat. No. 4,070,563. This application Dec. 17, 1979, Ser. No. 104,540

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.[3] G01F *23/14*

U.S. Cl. 364—510 **5 Claims**



1. A system of measurement of flow gains between ends of a sewer line, said line extending between an upstream manhole and a downstream manhole, and having a first sewer pipe with an exit end at the downstream manhole, and there being a second sewer pipe having an exit feeding said upstream manhole, comprising:

first and second monitoring assemblies, said first monitoring assembly being positioned in the end region of said first sewer pipe, and said second monitoring assembly being positioned in an end region of said second sewer pipe, and wherein each monitoring assembly comprises:

liquid level sensing means for sensing liquid level and providing as an output a signal which is a function of liquid level,

mounting means for mounting and positioning said liquid level sensing means in said end regions of said sewer pipes, and

sampling and recording means for periodically and synchronously, as between monitoring assemblies, and responsive to said liquid level sensing means, sampling and recording time identified said signals over a selected period of time;

conversion means responsive to selected recorded signals for converting said signals into liquid flow rates;

computation means responsive to said conversion means and dry and rainy day samples of values from each of said monitoring assemblies supplied said conversation means for (1) determining the difference between like timed, time of day, dry and rainy day flows from said first sewer pipe, (2) determining the difference between like timed, time of day, dry and rainy day flows from said second sewer pipe, and (3) determining the differences between said difference flows obtained as per (1) and (2) of this paragraph; and

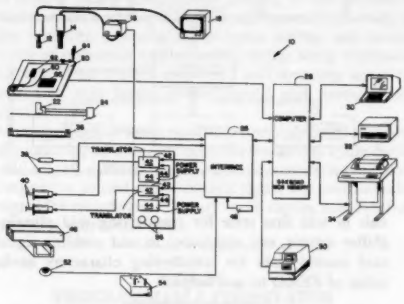
control means for selectively fetching samples from said sampling and recording means and placing same in said conversion means, whereby readings and computations may be made at selected times, and thereby measurements may be made during rainfalls which are representative of inflow into said pipe, and measurements made following rainfalls are representative of infiltration into a said pipe.

4,295,198

AUTOMATIC PRINTED CIRCUIT DIMENSIONING, ROUTING AND INSPECTING APPARATUS

Robert K. Copeland, Pennington, and Richard J. Dimaggio, Trenton, both of N.J., assignors to Cogit Systems, Inc., Princeton, N.J.

Filed Apr. 2, 1979, Ser. No. 26,436
Int. Cl.³ G05B *19/42*; H04N *7/18*
U.S. Cl. 364—515 **24 Claims**



22. An automatic inspecting apparatus for scanning a first object and comparing certain features of said first object to certain features of a second object, said apparatus comprising:

means for supporting said first object;

means for scanning said first object and producing a first set of scan data representative thereof;

processing means for processing said first set of scan data to detect said certain features of said first object, said processing means producing a first set of processed data representative of said features of said first object, said first set of processed data being smaller in volume than said first set of scan data;

comparison means for comparing said first set of processed data against a pre-stored second set of processed data representative of said certain features of said second object and producing an electrical output representative of said comparison; and,

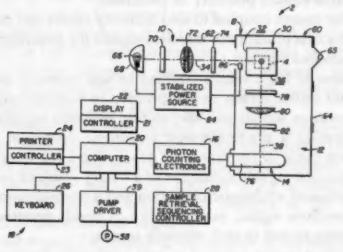
reporting means for producing an output representative of the output from said comparison means.

4,295,199

AUTOMATIC FLUOROMETER AND DATA PROCESSOR FOR PERFORMING FLUORESCENT IMMUNOASSAYS

Robert E. Curry, Novato, and Michael G. Simonsen, San Rafael, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Oct. 22, 1979, Ser. No. 86,917
Int. Cl.³ G01N *33/16*
U.S. Cl. 364—555 **44 Claims**



1. A fluorescence immunoassay apparatus for quantitating relatively small amounts of a clinically significant composition comprising:

transparent means including a member constructed of a transparent material and defining therein a hollow cell for holding a liquid sample including fluorescent particles;

means for flowing the sample into and out of the cell including an inlet to and an outlet from the cell;

a sample probe;

intake tubing fluidly communicating the probe with the inlet;

discharge tubing fluidly communicating the outlet with a sample discharge point;

a pump located downstream of the outlet for intermittently flowing a sample from the probe to the cell, for maintaining the sample in the cell for a period of time, and for thereafter removing the entire sample from the cell and the intake tubing and replacing the removed sample with a fresh sample;

whereby the sample is not subjected to the flow inducing action of the pump until after it has passed the cell;

a light source for generating a stable light beam focused on the sample;

whereby the light beam causes fluorescent emissions by the particles in the sample, the intensity of which emissions is a function of the intensity of the light beam and the quantity of fluorescent particles in the sample; and

means in optical communication with the transparent means for detecting photons resulting from fluorescent emissions by the particles when excited by the light beam;

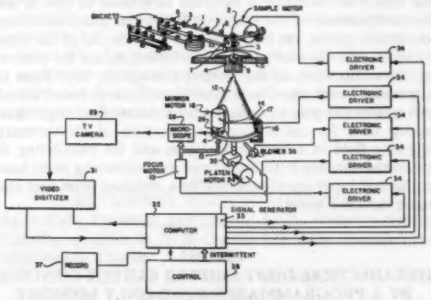
whereby the number of photons detected by the photon detecting means is a function of the number of fluorescent particles in the sample.

4,295,200

AUTOMATIC PARTICLE ANALYZING SYSTEM

Richard F. Johnson, Vero Beach, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1979, Ser. No. 90,787
Int. Cl.³ G01N *15/02*
U.S. Cl. 364—555 **14 Claims**



1. An automated system for analyzing particulate matter comprising:

a supply of said particulate matter,

a horizontally-disposed wheel-like platen,

means for feeding a portion of said supply particles to said platen,

means for distributing said portion in a single-file arrangement on the peripheral edge portion of the platen,

means for rotatably driving said platen,

means for scanning a frame area of said peripheral edge and for generating an electrical scan output, said scanned frame area being fixed relative to platen rotation, and

signal generating means operatively coupled to said scanned output and having an output coupled to said platen drive,

said generating means being operatively responsive to said scanned output for stopping said platen rotation when one of said particles is within said frame area whereupon a stationary particle is sequentially viewed and for resuming said rotation upon completion of said sequentially viewing whereupon another particle is carried into said frame area for viewing.

4,295,201

ELECTRONIC DISTANCE-MEASURING INSTRUMENT

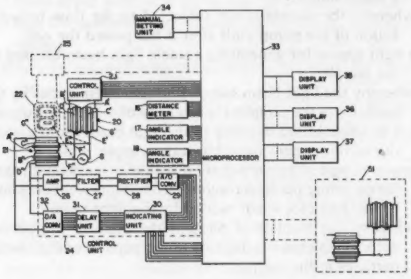
Klas R. Wiklund, Täby, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Aug. 21, 1979, Ser. No. 68,440

Claims priority, application Sweden, Apr. 27, 1979, 7903749; Jun. 18, 1979, 7905325

Int. Cl.³ G01B 7/14

U.S. Cl. 364—561 **7 Claims**



1. An electronic distance measuring instrument comprising an electronic distance meter; vertical angle determining means for establishing at least one vertical angle; horizontal angle determining means for establishing the angle between the instrument and the horizontal plane; and calculating means for trigonometrical transformations of input signals received by the instrument, said horizontal angle determining means comprising a terrestrial magnetic field detector comprising at least two detector units which are fixedly mounted in the instrument and which are oriented in different directions so that at least two components of the magnetic flux in an instrument-based coordinate system can be established with the aid of the detector units; said calculating means including means for converting the components of the terrestrial magnetic field from the instrument-based coordinate system to an earth-based coordinate system using an input signal from the vertical angle determining unit; for calculating the direction of the terrestrial magnetic field in a horizontal plane; and for calculating the horizontal distance from fixed point to a measuring point based on the said input signals and the data obtained from said electronic distance meter.

4,295,202

HEXADECIMAL DIGIT SHIFTER OUTPUT CONTROL BY A PROGRAMMABLE READ ONLY MEMORY

Thomas J. Joyce, Burlington, and David E. Cushing, Chelmsford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 9, 1979, Ser. No. 92,810

Int. Cl.³ G06F 7/48

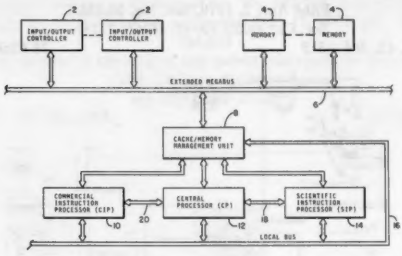
U.S. Cl. 364—748 **20 Claims**

1. A shifter unit for performing scientific arithmetic operations comprising:

shifting means for receiving a mantissa and responsive to a plurality of shift signals for generating a plurality of shifter signals indicative of said mantissa shifted a number of positions specified by said shift signals;

multiplexer means coupled to said shifting means for receiving said shifter signals for transfer to an output;

read only memory means responsive to said plurality of shift signals for generating a plurality of enabling signals in a first state and a plurality of enabling signals in a second state, said multiplexer means being coupled to said read only memory means and responsive to said enabling sig-



nals in said first state for transferring said plurality of shifter signals, and responsive to said enabling signals in said second state for transferring characters having a value of ZERO to said output.

4,295,203

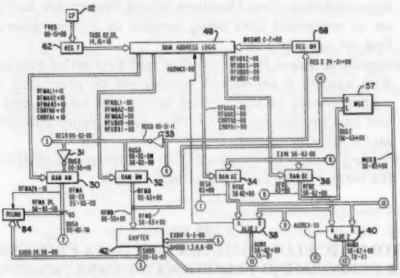
AUTOMATIC ROUNDING OF FLOATING POINT OPERANDS

Thomas F. Joyce, Burlington, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Nov. 9, 1979, Ser. No. 92,907

Int. Cl.³ G06F 7/48

U.S. Cl. 364—748 **7 Claims**



1. Apparatus for performing a scientific arithmetic rounding operation comprising:

memory means for storing a plurality of mantissas and generating a plurality of mantissa signals indicative of the binary value of said plurality of mantissas;

shifter means coupled to said memory means and responsive to a first plurality of mantissa signals for generating shifted mantissa signals;

arithmetic logic means coupled to said memory means and said shifter means and responsive to a second plurality of mantissa signals and said shifted mantissa signals for performing a predetermined arithmetic operation during a first cycle of operation for generating a plurality of result mantissa signals indicative of a binary result of said predetermined arithmetic operation and a normalization and an overflow signal, said plurality of result mantissa signals being stored in said memory means;

rounding means coupled to said arithmetic logic means for receiving a first signal and a second signal of said plurality of result mantissa signals, said rounding means being responsive to a rounding signal and a length signal in a first

state for selecting said first signal, and said length signal in a second state for selecting said second signal for generating a round request signal;

control means coupled to said rounding means and responsive to said round request signal for generating a round control signal, said rounding means being responsive to said round control signal and said rounding signal for rounding said binary result during a second cycle of operation;

said control means being further coupled to said arithmetic logic means and responsive to said normalization signal for initiating a normalization cycle during said second cycle of operation, said rounding means being responsive to said round control signal and said rounding signal for rounding said binary result during said normalization cycle,

said control means being responsive to said overflow signal for initiating an overflow mantissa correction cycle during said second cycle of operation, said rounding means being responsive to said round control signal and said rounding signal for rounding said binary result during said overflow mantissa correction cycle.

4,295,204

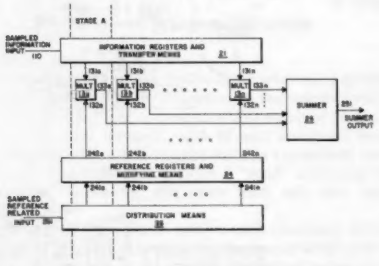
PROGRAMMABLE CORRELATOR

Drew E. Sunstein, 19 Parkhurst Dr., Nashua, N.H. 03060

Filed May 31, 1979, Ser. No. 44,392

Int. Cl.³ G06G *7/19*

U.S. Cl. 364—824 **6 Claims**



1. A programmable correlator for correlating a sampled information signal with a programmable reference signal, such correlator comprising a plurality of correlator stages connected in cascade, each stage including:

(a) an information register, having an input for receiving at a given instant in time a sample of the information signal, a first output related to the signal stored in the register, and a second output also related to the signal stored in the register;

(b) a reference register, having an input for receiving a signal related to the programmable reference signal, and an output related to the stored signal;

(c) a multiplier, having a first input connected to the first output of the information register, a second input connected to the output of the reference register, and an output related to the product of the signals present at the multiplier's first input and its second input;

(d) first means, for transferring the sample of the information signal, from the second output of the information register in such stage, to the input of the information register in the next successive stage, such transfer being accomplished without undesirable amounts of changes in the signal stored in the reference register;

(e) second means, for summing the outputs of the multipliers in each stage; and

(f) third means, distinct from the reference register, for distributing one of a series of consecutive samples of a signal related to the reference signal to each reference register of the device, so that collectively the reference registers have received all samples in the series.

4,295,205

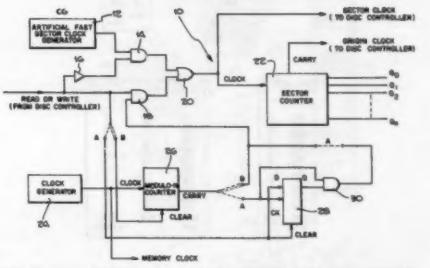
SOLID STATE MASS MEMORY SYSTEM COMPATIBLE WITH ROTATING DISC MEMORY EQUIPMENT

George H. Kunstadt, 4450 La Barca, Tarzana, Calif. 91356

Filed Oct. 16, 1978, Ser. No. 951,711

Int. Cl.³ G06F *3/00*; G06G *7/48*

U.S. Cl. 364—900 **6 Claims**



1. A mass memory system, having a plurality of memory modules, other than rotating disc memories, compatible with memory equipment employing a disc memory controller designed to operate only with rotating disc memories and in conjunction with a computer, said system comprising:

means connected to a disc memory controller for providing signals simulating origin and sector signals like those which are transmitted from a rotating disc memory system and for transmitting said signals to a disc memory controller; and

memory module selecting means for selecting one of said memory module for a read or write operation, said memory module selecting means being connected to said means for providing signals simulating origin and sector signals like those which are transmitted from a rotating disc memory system and also being connected to said plurality of memory modules and being responsive to cessation of said simulated origin and sector signals to select one of said memory module, whereby said memory equipment designed to operate only with rotating disc memories is usable with solid state memories having a plurality of memory modules other than rotating disc memories.

4,295,206

DOCUMENT SORTING METHOD

John D. Cain, Kitchener, and Gary C. Lovie, Waterloo, both of Canada, assignors to NCR Canada Ltd.-NCR Canada Ltee, Mississauga, Canada

Filed Jun. 6, 1979, Ser. No. 45,820

Int. Cl.³ G06F *7/08*

U.S. Cl. 364—900 **8 Claims**

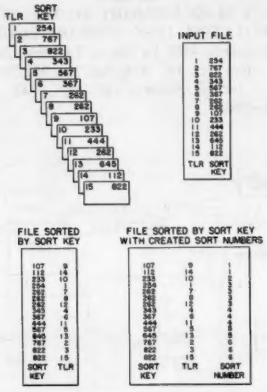
2. In a data processing system, a method of sorting a plurality of documents into selected pockets of a sorter comprising the steps of:

building a record file of data from said documents in physical sequential order with each document containing a sort key thereon,

determining the number of different sort keys for said documents by arranging the record file of data in sort key numerical order, those document records in the record file having the same sort key being arranged in physical sequence,

assigning sort numbers to said record file of data in a manner wherein all documents with the same sort key will have the same sort number when sequentially read for ascend-

ing order and incrementing the sort number in ascending numerical order upon encountering a descending physical sequence order, and



transporting said documents to said selected pockets identified by sort numbers assigned to said record file of data.

4,295,207

DATA PROCESSING APPARATUS FOR RECEIVING AND DECODING WORDS IN WHICH DATA IS ENCODED BY PHASE REVERSALS OR NON-PHASE REVERSALS OF A SIGNAL OF A PREDETERMINED FREQUENCY

Martin L. Resnick, Chestnut Hill, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 14, 1979, Ser. No. 94,241
Int. Cl.[3] G06F *3/05, 5/00*
U.S. Cl. 364—900 **21 Claims**

1. A data processing apparatus for receiving and processing coded words, each word including, in succession, a reference bit, a start bit, and additional bits, said bits being encoded within a corresponding number of bit periods by a predetermined number of cycles of a signal of a predetermined frequency, said start bit being reversed in phase with respect to the phase of the reference bit to represent a first logic value and each of the additional bits being either reversed in phase or not reversed in phase with respect to the preceding bit thereby to represent a first logic value or second logic value, respectively, said apparatus comprising:

an input arranged to receive each word;

first sampling means arranged to take successive samples of each word received at the input;

comparator means operative to compare samples taken by the first sampling means with frequency data representing a signal of the predetermined frequency and at least one approximation thereof;

first means operative when samples produced by the first sampling means compare with the frequency data of the comparator means to produce a condition indicating the reception of a reference bit;

second means operative following the aforesaid condition produced by the first means and when succeeding samples produced by the first sampling means do not compare with the frequency data of the comparator means to invert said samples;

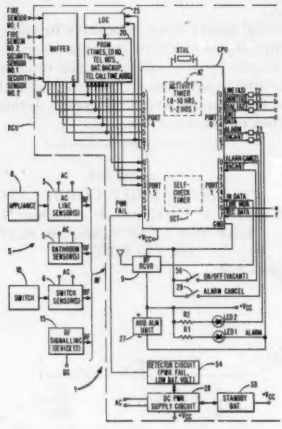
said comparator means being further operative to compare the inverted samples with the frequency data;

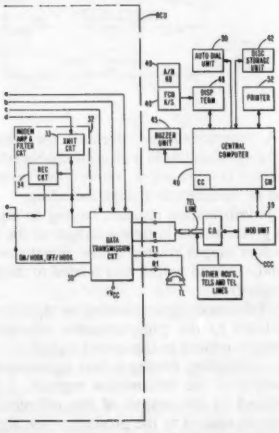
third means operative when inverted samples compare with the frequency data of the comparator means to produce a condition indicating a phase reversal corresponding to a start bit of the sampled word;

start means operative following the aforesaid condition produced by the third means to establish a count representing a predetermined time period the expiration of which corresponds to a predetermined point in the next bit period following the start bit period;

second sampling means arranged to alter the count established by the start means and operative at the expiration of the predetermined time period to take successive samples of the word at the input;

fourth means operative for each successive bit period following the start bit period to establish a count representing the aforesaid predetermined time period the expiration of which corresponds to the predetermined point in the next bit period;





said second sampling means being further operative to alter the count established by the fourth means and operative at the expiration of the predetermined time period to take successive samples of the word at the input;

fifth means arranged for each bit period following the start bit period and following the establishing of each count representing the predetermined time period by the fourth means to determine the phase of the bit in the previous bit period relative to the reference phase, and operative if the phase is different from the reference phase to invert the samples taken by the second sampling means and if the

phase is the same as the reference phase to not invert the samples taken by the second sampling means;

said comparator means being further operative following each determination by the fifth means to compare the inverted or non-inverted samples of the fifth means with the frequency data;

sixth means operative if inverted or non-inverted samples of the fifth means in each bit period following the start bit period compare with the frequency data of the comparator means to produce an output of the second logic value;

seventh means operative if inverted or non-inverted samples of the fifth means in each bit period following the start bit period do not compare with the frequency data of the comparator means to invert the samples;

said comparator means being further operative to compare the inverted samples of the seventh means with the frequency data; and

eighth means operative if the inverted samples of the seventh means compare with the frequency data of the comparator means to produce an output of the first logic value.

4,295,208

SIGNALLING SYSTEM INCLUDING APPARATUS FOR GENERATING AND TESTING DATA AND COMMAND WORDS WITHIN FIRST AND SECOND MESSAGE INTERVALS

Robert A. Norbedo, North Andover, and Martin L. Resnick, Chestnut Hill, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 14, 1979, Ser. No. 94,245

Int. Cl.[3] **G06F** *3/04, 11/30*

U.S. Cl. 364—900 **17 Claims**

1. In a signalling system, apparatus comprising:

an input terminal;

an output terminal;

first means arranged during a first message interval to generate and apply data words in succession to the output terminal and to receive and test command words received in succession at the input terminal, each of said command words including flag data specifying the word as a command word, command data representing either a "send" command or a "retransmit" command, and other data, said first means comprising:

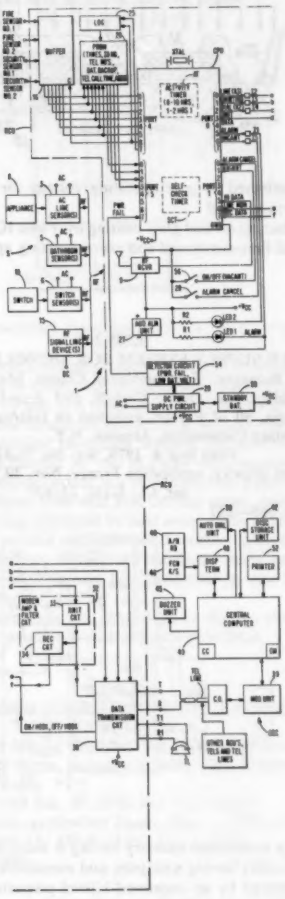
first test means operative to receive each command word at the input terminal and to test the command word to determine whether the word satisfies prescribed requirements of command words including whether the flag data specifies the word as a command word and the command data represents a "send" command or a "retransmit" command; and

send/retransmit means operative if a command word tested by the first test means satisfies the prescribed requirements of a command word and represents a "send" command to generate and apply a data word to the output terminal, and operative if a command word tested by the first test means satisfies the prescribed requirements of a command word and represents a "retransmit" command to reapply the data word last applied to the output terminal back to the output terminal; and

second means arranged during a second message interval to receive and test data words received in succession at the input terminal and to generate and apply command words in succession to the output terminal, each of said data words including flag data specifying the word as a data word and other data, and each of the command words including command data representing either a "send" command or a "retransmit" command, said second means comprising:

second test means operative to receive each data word at the input terminal and to test the data word to determine whether the data word satisfies prescribed requirements of a data word including whether the flag data specifies the word as a data word; and

third means operative if a data word tested by the second test means satisfies the prescribed requirements of a data word to generate and apply a command word including command data representing a "send" command to the output terminal for requesting the next word, and operative if a data word tested by the second test means does



not satisfy the prescribed requirements of a data word to generate and apply a command word including command data representing a "retransmit" command to the output terminal for requesting the previous word.

4,295,209

PROGRAMMING AN IGFET READ-ONLY-MEMORY

William B. Donley, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1979, Ser. No. 98,211

Int. Cl.[3] **G11C** *17/00, 11/40*

U.S. Cl. 365—178 **2 Claims**

1. A programmed read-only-memory comprising:

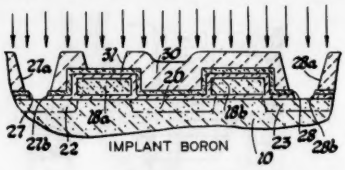
an array of programmable IGFETs on a semiconductor surface;

a silicon nitride coating on said surface, with apertures therein for electrically contacting all of said programmable IGFETs;

a glass coating on said silicon nitride coating, with apertures therein corresponding to said first-mentioned apertures

and additional apertures over channel regions of selected IGFETs;

said selected IGFETs having ion implanted channel regions



unaffected by gate operating voltage for said read-only-memory; and

conductors on said glass coating over said IGFETS through said first-mentioned and corresponding apertures.

4,295,210

POWER SUPPLY SYSTEM FOR MONOLITHIC CELLS

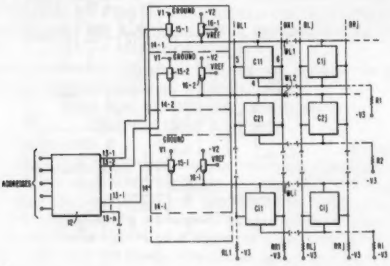
Herve Beranger, Fontainebleau; Claude Marzin, Mennecy; Dominique M. Omet, Corbeil, and Jean-Luc Peter, Ris-Orangis, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 4, 1979, Ser. No. 71,826

Claims priority, application France, Nov. 30, 1978, 78 34434

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—227 **3 Claims**



1. In a monolithic memory having n word lines and an address decoder having n outputs, said monolithic memory being characterized by an improved bilevel powering system, said powering system including:

n discrete current switch circuit means;

each of said n current switch circuit means having an input and an output;

each of said n current switch circuit means having its input connected to a predetermined one of said n outputs of said address decoder and its output connected to a discrete one of said n word lines; and

each said current switch circuit means including, a first transistor having an emitter, base and collector and a second transistor having an emitter, base and collector, said base of said first transistor being connected to said input of said current switch circuit means, said collector of said first transistor being connected to a source of potential having a magnitude $|V1|$, said base of said second transistor being connected to a reference potential, said collector of said second transistor being connected to a source of potential having at magnitude of $|V2|$, where $|V1|<|V2|$, and said emitters of said first and second transistors being connected in common to the output of said current switch means.

4,295,211

INERTIALLY RELEASED JETTISONABLE AIRBORNE BUOY

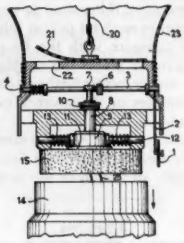
Vito Suppa, and Daniel Viallet, both of Paris, France, assignors to Thomson-CSF, Paris, France

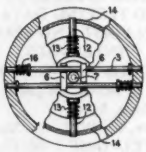
Filed Feb. 22, 1980, Ser. No. 123,817

Claims priority, application France, Feb. 27, 1979, 79 05002

Int. Cl.³ H04B *1/59*

U.S. Cl. 367—4 **7 Claims**





1. A radio buoy incorporating a hydrophone which can be jettisoned into the water from an aircraft and having two separate parts, an upper part containing a transmission antenna and the electronics associated therewith for transmitting the sound waves detected in water by the hydrophone, and supporting a float balloon protected by a casing, said balloon inflating during the fall of the buoy by means of a forced air intake established by the raising of openings in the form of scoops located at the bottom of the balloon, a lower diving part containing the hydrophone and its drum of wound suspension cable, whereby the hydrophone can be submerged at depths up to 2,000 meters, wherein the upper part of the buoy includes means operated by the raising of the scoops for unlocking the two separate parts of said buoy.

4,295,212

LINEAR ACOUSTIC ARRAY

Richard C. Swenson, Carriere, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 28, 1980, Ser. No. 115,643

Int. Cl.³ G01V *1/38;* H04R *1/44*

U.S. Cl. 367—20 **8 Claims**

1. A flexible linear array for use in oceanography, said array comprising:

a braided mesh tube formed of a plurality of flexible strands defining a central lumen;

a plurality of instrumentation assemblies disposed within said tube at instrumentation stations spaced at predetermined distances from one another along the length thereof;

said tube being adapted to constrict only a limited amount to a predetermined minimum diameter when under linear tension so that said instrumentation assemblies are gripped by said tube while those portions of said lumen lying between said assemblies remain open while being of reduced diameter relative to the portions of said lumen containing said assemblies; and

conductor means of greater lengths than said distances interconnecting said assemblies and extending freely through

said open, reduced diameter portions of said lumen without being gripped by said strands defining said reduced

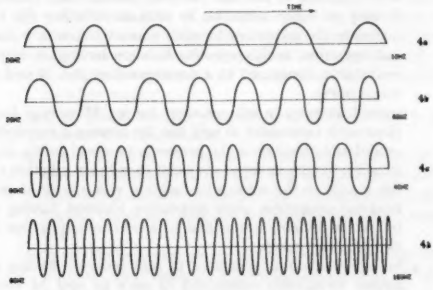
diameter portions, whereby said conductor means are free of said linear tension.

4,295,213

COMPOSITE SEISMIC SIGNAL

Joseph F. Mifsud, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Oct. 9, 1979, Ser. No. 83,059
Int. Cl.³ G01V *1/143*
U.S. Cl. 367—41 **8 Claims**



1. A method of generating a seismic signal of selected frequency content comprising:

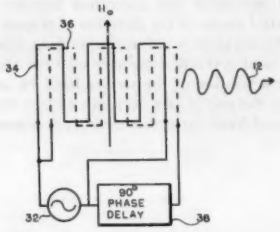
generating simultaneously from substantially the same location a plurality of component swept sine wave seismic signals covering selected frequency segments within the frequency spectrum of said seismic signal of selected frequency content wherein said selected frequency segments do not substantially overlap in frequency content, said plurality of component swept since wave seismic signals including at least two signals substantially covering two of said frequency segments which are substantially contiguous in frequency content, the swept sine wave seismic signal substantially covering one of said two frequency segments sweeping in an ascending order of frequency and the swept sine wave seismic signal substantially covering the other of said two frequency segments sweeping in a descending order of frequency; and correlating the sum of said plurality of component swept sine wave seismic signals with the sum of the reflections of said plurality of component swept sine wave seismic signals.

4,295,214

ULTRASONIC SHEAR WAVE TRANSDUCER

Robert B. Thompson, Thousands Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 23, 1979, Ser. No. 68,988
Int. Cl.³ G01N *29/04*
U.S. Cl. 367—140 **9 Claims**



1. A unidirectional electromagnetic acoustic transducer, comprising:

a first electrical conductor adapted to carry a first alternating current in a first current plane, said first current being conveyed by said first conductor at any instant in parallel and alternate directions spaced by a uniform amount;

a second electrical conductor adapted to carry a second alternating current 90° out of phase with respect to said first alternating current in a second current plane substantially coplanar with said first current plane, said second current being conveyed by said second conductor at any instant in parallel and alternate directions spaced by said uniform amount, said second conductor being parallel to but staggered from said first conductor by one half said uniform amount; and

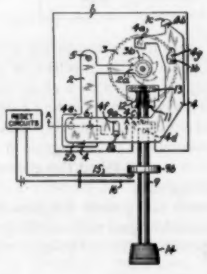
a source of magnetic flux positioned to direct a static magnetic field parallel to said alternate directions.

4,295,215

SECOND HAND CORRECTION DEVICE FOR USE IN TIMEPIECES

Kiyoshi Kitai; Masuo Ogihara, and Kozo Chimura, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1979, Ser. No. 15,624
Claims priority, application Japan, Mar. 1, 1978, 53/23898
Int. Cl.³ G04B *27/02, 17/12, 27/00*
U.S. Cl. 368—196 **7 Claims**



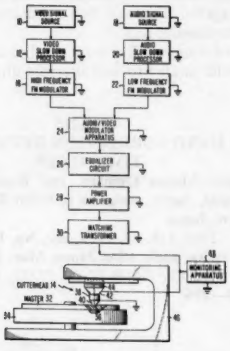
1. Second hand correction device in a timepiece having a second hand that regularly rotates in a particular direction, comprising, a second hand axis provided with a cam wheel fixed thereto and having a plurality of cams, a second hand correction member manually movable in a forward direction and a reverse direction and rotationally, control means for

controlling the forward and reverse direction movements of said second hand correction member such that during forward movement of said correction member, said correction member is first rotated in a direction opposite to the regular direction of rotation of said second hand axis by said control means, and then said second hand correction member is engaged with one of said cams of said cam wheel, and thereafter during further forward movement said correction member is displaced by said control means in the direction of regular rotation of said second hand axis so as to forcibly rotate said cam wheel as said second hand correction member continues to move so as to advance a position of the second hand by an amount determined by the one of said cams of said cam wheel with which said second hand correction member is engaged.

4,295,216
APPARATUS FOR MEASURING THE CHARACTERISTICS OF A WIDEBAND ELECTROMECHANICAL RECORDING SYSTEM HAVING A TRANSFORMER

Raymond L. Truesdell, Cherry Hill, and Michael D. Ross, Somerdale, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 30, 1980, Ser. No. 154,907
Int. Cl.³ H04N *5/76;* **G11B** *27/36*
U.S. Cl. 369—55 **9 Claims**



1. A monitoring apparatus for measuring a mechanical characteristic of a wideband electromechanical cutterhead in a system for recording signals within a given range of frequencies in a disc master, said system including a source for supplying said signals, said cutterhead being responsive to said signals for recording representations of said signals in said disc master when relative motion is established therebetween; said monitoring apparatus comprising:

means, connected to said source, for providing signals of a first polarity to a first signal path and for providing signals of polarity opposite to said first polarity to a second signal path;

said first signal path including said cutterhead and a sensing capacitor;

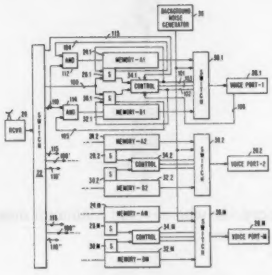
said second signal path including a balancing capacitor and said sensing capacitor;

said balancing capacitor having a capacitance value such that the potential difference across said sensing capacitor is a substantial representation of said mechanical characteristic of said cutterhead.

4,295,217
APPARATUS TO REDUCE THE EFFECT OF A MID-TALKSPURT FREEZE-OUT

John W. Fennel, Jr., Olney; Robert J. Hallett, Adelphi, both of Md.; Stanley M. Head, and Constantine M. Melas, both of Los Gatos, Calif., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,076
Int. Cl.³ H04J *3/16*
U.S. Cl. 370—81 **4 Claims**



1. In a TDMA communication system having at least one transmission station where voice signals are digitized and transmitted over a communication link to a receiver having M voice ports, in no more than M time division multiplexed channels per frame period, apparatus for reducing the effects of voice channel freeze-out, comprising:

a first memory in said receiver having M storage locations each connected to said link for storing a respective one of said channels in the last received frame, each location having an input status bit to indicate whether the last access to the respective location was a write-in or a read-out operation, each respective location having an output switchably connected to a corresponding one of said M voice ports;

a second memory in said receiver having M storage locations each connected to said link for storing a respective one of said channels in the presently received frame, each location having an input status bit to indicate whether the last access to the respective location was a write-in or a read-out operation, each respective location having an output switchably connected to a corresponding one of said M voice ports;

a background noise generator in said receiver having an output switchably connected to each of said M voice ports;

control means in said receiver having an input connected to each of said input status bits in said first and second memories, having a first plurality of control outputs each connected to a respective one of said locations in said first memory for switchably connecting the output of each of said locations in said first memory to said corresponding voice port in response to the input status bit for the corresponding location in said second memory indicating that the respective channel in said present frame has not been stored, said control means including a second plurality of control outputs each connected to a respective one of said second memory locations, for switchably connecting the output of said background noise generator to said corresponding voice port in response to the input status bit for the corresponding location in said first and second memories indicating that the respective channel in said last frame and the respective channel in said present frame have not been stored;

whereby said corresponding voice port receives the corresponding last channel received when the corresponding present channel has not been received over said link, and

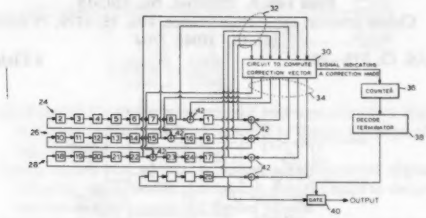
receives a background noise signal when said corresponding channels from more than one consecutive frame are not received over said link.

4,295,218

ERROR-CORRECTING CODING SYSTEM

Robert M. Tanner, Capitola, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Filed Jun. 25, 1979, Ser. No. 51,416
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—40 **10 Claims**



1. In self-correcting date transmitting apparatus wherein a selected member of a family of codewords is transmitted, thereafter received in a modified state, and then interpreted at the receiving end as being the member closest in appearance to the modified codeword, the method of transmitting and correcting data comprising the steps of:

(a) establishing the family of codewords by

(a1) selecting a connected bipartite undirected graph having a plurality of first nodes and a plurality of second nodes connected together by a plurality of edges and wherein none of said first nodes are connected to another of said first nodes and none of said second nodes are connected to another of said second nodes;

(a2) assigning a digit position for the codeword to each of said first nodes;

(a3) assigning subcode definitions to be associated with each of said first nodes;

(a4) assigning a set of values to be associated with selected ones of said second nodes such that as inputs to the ones of said first nodes connected to said selected ones of said second nodes said subcode definitions thereof are satisfied;

(a5) establishing said set of values from step (a4) in the digit sequence assigned in step (a2) as a member of the family of codewords; and,

(a6) repeating steps (a4) and (a5) for different sets of values until the desired number of members of the family have been established;

(b) placing the digits of each codeword as received following transmission in individual storage registers connected as inputs to test nodes corresponding to said first nodes of said graphs;

(c) testing the contents of said storage registers as inputs against said subcode definitions associated with said first node;

(d) using the contents of said storage registers as the received codeword is all said subcode definitions are satisfied, otherwise continuing to step (e);

(e) using the contents of said storage registers as the received codeword if a preselected number of corrective iterations have been tried, otherwise continuing to step (f); and,

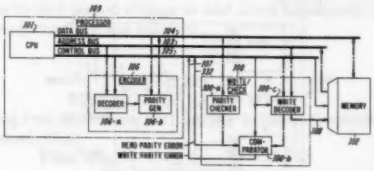
(f) modifying the contents of at least one of said storage registers which is connected as an input to one of said nodes which has its associated subcode definition unsatisfied and returning to step (c).

4,295,219

MEMORY WRITE ERROR DETECTION CIRCUIT

Don R. Draper, Lisle, and Peter Kusulas, Jr., Glen Ellyn, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1980, Ser. No. 135,248
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—51 **4 Claims**



1. A data processing system comprising:

a processor (**109**) for generating data words comprising a plurality of bytes each having a plurality of data bits and check bits, for generating address signals defining memory data word locations, and for generating byte write signals identifying specific bytes of said data words;

control decoder means (**100-c**) responsive to said byte write signals to selectively generate a write control signal for each byte identified by said byte write signals;

a memory arrangement (**102**) comprising a plurality of memory data word locations, each having a plurality of byte portions and responsive to said address signals and write control signals for storing said bytes into one of said memory data word locations;

transmission means interconnecting said processor, said control decoder and said memory arrangement for transmitting said data words, said address signals, and said byte write signals; and

checker means (**100-*a***) connected to said transmission means for generating a first output signal for each of said bytes whose bits have a predetermined arithmetic or logical relationship and for generating a second output signal for each of said bytes whose bits have some relationship other than said predetermined arithmetic or logical relationship; characterized in that

said processor further comprises a check bit generator (**106**) responsive to said byte write signals for generating said check bits such that for each byte identified by said byte write signals the bits have said predetermined arithmetic or logical relationship, and for all other bytes the bits have some relationship other than said predetermined relationship; and

said data processing system further comprises comparator means (**100-*b***) connected to said checker means and to said control decoder means responsive to said write control signals and said output signals for generating a write memory error signal if for one of said bytes both said write control signal and said second output signal are generated.

4,295,220

CLOCK CHECK CIRCUITS USING DELAYED SIGNALS

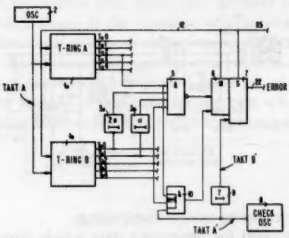
Arnold Blum, Gechingen; Hellmuth R. Geng, Herrenberg; Hermann Schulze-Schoelling, Gaertringen, and Bernd Spaeth, Stuttgart, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1979, Ser. No. 98,587
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853546
Int. Cl.³ H03K *5/19*; G06F *1/04*
U.S. Cl. 371—61 **15 Claims**

1. In a data processing system having a plurality of synchronized clocks therein, each of the clock outputs having a predetermined number of period signals in each cycle of operation,

apparatus for checking clock synchronization, said apparatus including:

(a) logic circuit means for receiving the time-based periodic signals from the clocks and for generating an output signal indicative of proper clock synchronization in response thereto;



(b) first circuit means connected between the clocks and said logic circuit means for applying a predetermined combination of the clock period signals to said logic circuit means; and

(c) second circuit means connected between said first circuit means and said logic circuit means for delaying at least one of the clock period signals before it is applied to said logic circuit means.

4,295,221

METHOD AND APPARATUS AT ONE-WAY OR TWO-WAY INFORMATION LINK TO EFFECT INTERFERENCE SUPPRESSION

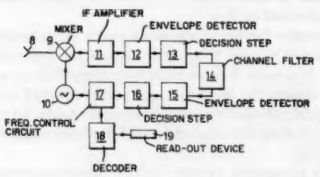
Bengt Henoch, Hägersten, and Eilert Berglind, Bandhagen, both of Sweden, assignors to Stiftelsen Institute for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm, Stockholm, Sweden

Filed Apr. 18, 1978, Ser. No. 897,374

Claims priority, application Sweden, Apr. 28, 1977, 7704935

Int. Cl.[3] H03K *5/08, 7/06*

U.S. Cl. 375—23 **9 Claims**



1. A method providing communication between first and second stations comprising the steps of providing a first pulse train containing certain information at said first station, chopping the pulses in said first pulse train at a constant pre-selected chopping frequency at said first station to develop a second pulse train, modulating said second pulse train onto a carrier signal at said first station, said carrier signal having a frequency tht is substantially higher than said chopping frequency, and said chopping frequency being individual to the communication link between said first and second stations to distinguish said link from other communication links, transmitting the thusly modulated carrier signal from said first station, receiving the transmitted carrier signal along with interference signals, if present, at said second station to provide a received signal, detecting the received signal at said second station to provide a detected signal having an intelligence signal component which contains said information and which has a pulse frequency corresponding to said pre-selected chopping frequency, filtering the detected signal at said second station to separate the intelligence signal component from other signal components of different frequencies and to thereby provide for the recovery of said intelligence signal component, and processing the recovered intelligence signal component following filtering to retrieve said information.

4,295,222

ARRANGEMENT FOR RESTITUTING THE CLOCK FOR A RECEIVER OF DATA TRANSMITTED BY PHASE MODULATION OF A CARRIER

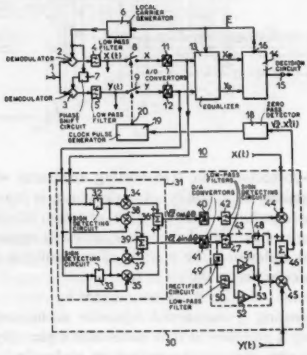
Jean-Pierre H. Van Uffelen, Chevilly Larue, France, assignor to Telecommunications Radioelectriques et Telephoniques, Paris, France

Filed Feb. 8, 1980, Ser. No. 120,015

Claims priority, application France, Feb. 15, 1979, 79 03833

Int. Cl.[3] H04L *7/04*

U.S. Cl. 375—106 **6 Claims**



1. An arrangement for restituting a clock included in the receiver of a system for the transmission of data by n-valent phase modulation of a carrier, and used to sample the demodulated signals formed by demodulation of the received signal with the modulating frequency by means of signals which are of the same phase and shifted 90° relative to a local carrier, this arrangement for restituting a clock comprising a circuit for controlling a local clock on the zero-passages of a signal characterized in that the circuit comprises local means to detect from the samples of said demodulated signals to which phase section, out of n possible phase sections of the transmitted signals, the phase of the received signal belongs at the sampling instants, and calculating means for forming the component which is of the same phase as, or the component which is shifted 90° relative to, the local carrier of a signal derived from the received signal by a phase shift $\Delta\theta$, so as to make its phase equal, at the sampling instants, to the centre phase of the said detected phase section, said component which is n phase with or shifted 90° relative to the local carrier constituting the signal whose zero transitions are used to control the local clock.

4,295,223

DIGITAL SIGNAL/NOISE RATIO AMPLIFIER APPARATUS FOR A COMMUNICATION SYSTEM

Harold B. Shutterly, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 25, 1979, Ser. No. 33,064

Int. Cl.[3] H04B *1/64;* **H04N** *7/16*

U.S. Cl. 455—72 **5 Claims**

1. In a communication system including a transmitter, a receiver and a communication channel, a signal modifier apparatus associated with said transmitter comprising:

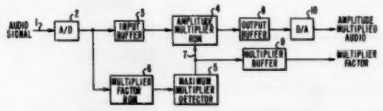
sampler means responsive to an input signal to be transmitted through said communication channel for deriving a

series of samples representative of a segment of said input signal;

analog-to-digital converter means for converting each sample to a digital sample value;

first means responsive to said digital sample values for subtracting a first predetermined digital value M_1 thereof to derive digital values representative of deviations of said input signal from said first predetermined value M_1;

second means for determining with said digital values representative of deviations a common factor K with $K>1$;



third means for multiplying each of said representative digital values by said common factor K to derive corresponding amplified digital values;

fourth means for adding a second predetermined digital value M_2 to each of said amplified digital values to derive corresponding augmented digital values;

digital-to-analog converter means for converting said augmented digital values into an intermediary analog signal;

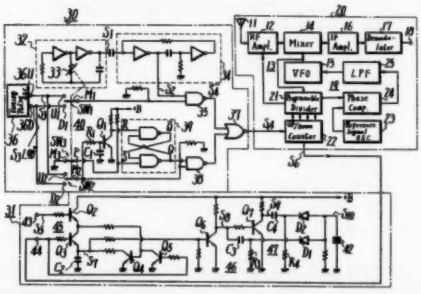
said transmitter transmitting said intermediary analog signal through said communication channel.

4,295,224

TUNING INDICATOR APPARATUS FOR A FREQUENCY SYNTHESIZER TUNER

Yoshinori Nishimura, Niiza; Kaoru Umeda, Kawasaki, and Hideo Harada, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 14, 1979, Ser. No. 66,383
Claims priority, application Japan, Aug. 16, 1978, 53-99850
Int. Cl.³ H04B *1/16*
U.S. Cl. 455—156 **11 Claims**



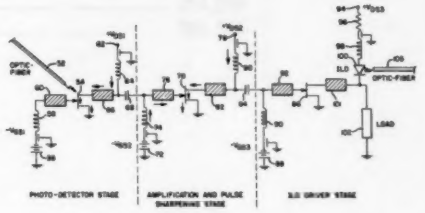
1. Apparatus for indicating a changing tuning condition in a frequency synthesizer tuner of the type having a phase-locked loop including a reference oscillator, a variable frequency oscillator to produce a local oscillating signal, a programmable frequency divider coupled to the variable frequency oscillator for dividing the frequency of said local oscillating signal by a variable dividing ratio to produce a frequency-divided oscillating signal, a phase comparator for comparing the frequency-divided oscillating signal to the output of the reference oscillator to produce an error signal, and means for feeding back the error signal from the phase comparator to the variable frequency oscillator to adjust the frequency of the local oscillating signal and thereby adjust the tuning condition of the tuner, said apparatus comprising a source of counter pulses; counter means for counting counter pulses supplied thereto, said counter means being coupled to said programmable frequency divider to determine the dividing ratio thereof; manually operable slide switch means slidable in a first range to enable only a predetermined number of counter pulses to be supplied to said counter means and slidable in a second range to enable counter pulses to be supplied continually to said counter means; sensing means for sensing when the count of said counter means changes by a predetermined amount; and sound generating means for generating an audible sound indication in response to said sensed change in said count to indicate that said tuning condition has changed.

4,295,225

FIBER OPTIC REPEATER

Jing-Jong Pan, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Aug. 18, 1978, Ser. No. 934,885
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—601 **10 Claims**



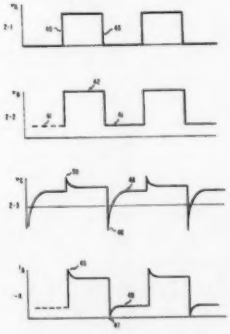
1. A fiber optic repeater comprising a photodetector circuit including an optic detecting MESFET coupled in said photodetector circuit to sense an optic input applied to the gate of said MESFET, an amplification and pulse sharpening circuit and a driver circuit connected in cascade with said photodetector circuit, said amplification and pulse sharpening circuit and said driver circuit each including a single MESFET.

4,295,226

HIGH SPEED DRIVER FOR OPTOELECTRONIC DEVICES

Leonard C. Dombrowski, Batavia, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 2, 1980, Ser. No. 165,380
Int. Cl.³ H04B *9/00*
U.S. Cl. 455—618 **7 Claims**



1. A high speed driver for a unidirectional optoelectronic device **(13)**, characterized by

means **(16, 30, 31, 32)** for biasing the device to draw a first prescribed steady-state current greater than zero when the

device is in a first state and a second prescribed steady-state current greater than the first prescribed current when the device is in a second state, and

means (35) for controlling the biasing means to cause the current drawn by the device momentarily to be a value less than that of the first prescribed current during a transition of the device from the second to the first state, thereby to simulate a negative current overdrive through the unidirectional drive.

DESIGN PATENTS

GRANTED OCT. 13, 1981

ERRATA

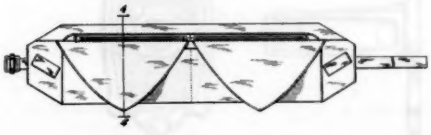
For CLASS	See PATENT NO.
D32–049	261,217
D34–001	261,218
D32–073	261,219
D32–021	261,266
D32–021	261,267
D32–032	261,268
D28–035	261,316

DESIGNS

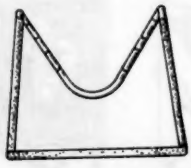
OCTOBER 13, 1981

261,195
SHOE
Howard K. Weiss, New York, N.Y., assignor to Glen Shoe Company, New York, N.Y.
Filed Feb. 23, 1979, Ser. No. 14,747
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—279

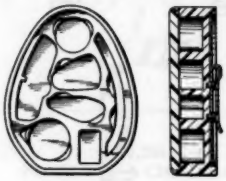
261,196
SPORTSMAN'S BELT
Robert P. Griffin, Orient, Iowa 50858
Filed Mar. 16, 1979, Ser. No. 21,075
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—383



261,197
BELT ATTACHABLE HAMMER HOLDER OR THE LIKE
Donald Rowswell, 678 Lauderdale Ave., London, Ontario, Canada
Filed Jan. 15, 1979, Ser. No. 3,182
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400

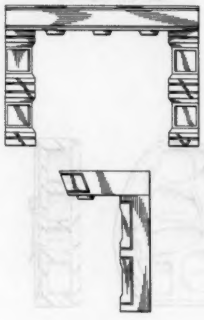


261,198
CONTAINER FOR CARRYING FIRST AID DATA AND EQUIPMENT
James Altadonna, 90 E. 2nd St., Deer Park, N.J. 11729
Filed Jun. 25, 1979, Ser. No. 27,403
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400

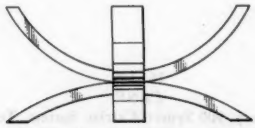


261,199
CANE
Allen W. Dockery, 900 Sypert, Carrizo Springs, Tex. 78834
Filed May 16, 1979, Ser. No. 39,788
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D3—7

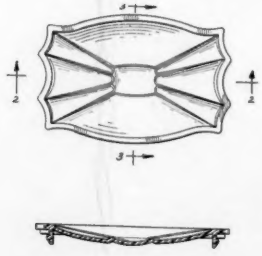
261,200
DISPLAY UNIT AND LIGHT FIXTURES THEREFOR
Jerry Shaw, 50 West Fairlawn Blvd., and Samuel G. Solitt, 2121 Brookshire Rd,, both of, Akron, Ohio 44313
Division of Ser. No. 781,653, Mar. 28, 1977, Pat. No. Des. 253,143. This application Jan. 19, 1979, Ser. No. 4,903
Term of patent 14 years
Int. Cl. D20—*02;* D25—*02;* D26—*05*
U.S. Cl. D6—85



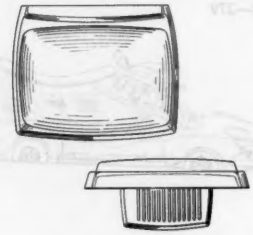
261,201
STAND
Jack E. Blake, P.O. Box 2102, Midland, Tex. 79701
Filed Apr. 4, 1979, Ser. No. 27,192
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85



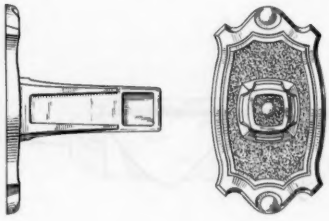
261,202
SOAP DISH FOR ATTACHMENT TO A FRAME
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,353
Term of patent 14 years
Int. Cl. D23—*02;* D7—*01*
U.S. Cl. D6—89



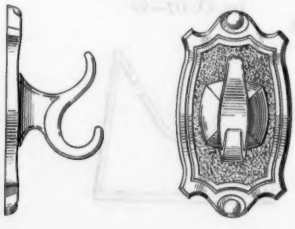
261,203
WALL MOUNTED SOAP DISH
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,358
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90



261,204
TOWEL BAR SUPPORT POST
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,362
Term of patent 14 years
Int. Cl. D23—*02;* D8—*08*
U.S. Cl. D6—103



261,205
DOUBLE HOOK CLOTHES SUPPORT
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,361
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—122

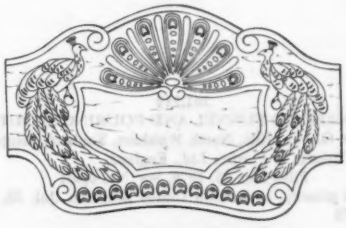


261,206
CHECK-OUT STATION ACCESSORY FRAME
Kenneth A. Lloyd, Jr., 10192 Orchard Park West Dr., Indianapolis, Ind. 46280
Filed Nov. 13, 1978, Ser. No. 960,002
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—143

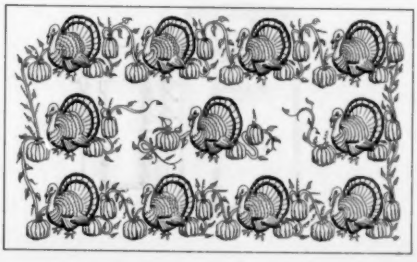
261,207
ROLL TOP WET BAR
Robert R. Robins, 721 N. Woodland, Minneapolis, Kans. 67467
Filed Dec. 3, 1979, Ser. No. 99,944
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—144

261,208
MIRROR
Richard J. Whiting, 66 Bonniebrook, Chatham, Ill. 62629
Filed Feb. 12, 1979, Ser. No. 11,450
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234

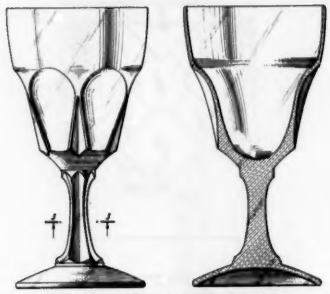
261,209
PANEL FOR A CHAIR BACK
David L. Lee, 1841 Port Margate Pl., Newport Beach, Calif. 92660, and Harry J. O'Connor, 26992 LaPaja, Mission Viejo, Calif. 92675
Filed Aug. 2, 1978, Ser. No. 930,585
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



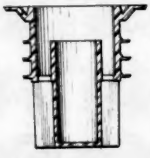
261,210
TABLECLOTH
Patricia Capanear, 102 Franklin Ave., Belleville, N.J. 07109
Filed Aug. 1, 1978, Ser. No. 930,084
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—286



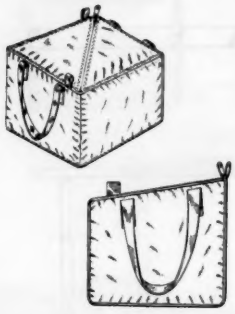
261,211
GOBLET OR SIMILAR ARTICLE
Jean-Jacques Durand, LaGarenne, 62510 Arques, France
Filed Jan. 3, 1980, Ser. No. 109,354
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—13



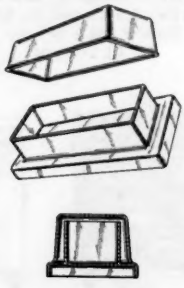
261,212
COMBINED FUNNEL AND POURING SPOUT
Frederick G. W. Mills, North Walsham, England, assignor to U.G. Closures & Plastics Ltd., England
Filed Jan. 25, 1979, Ser. No. 6,401
Claims priority, application United Kingdom, Jul. 28, 1978, 985662/78
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—68



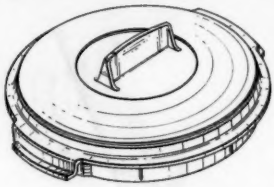
261,213
INSULATED CARRIER FOR FOOD OR THE LIKE
Charles M. Perethian, Arroyo Grande, Calif.; Marcia L. Le Compte, and Bruce W. Vetter, both of Champaign, Ill., assignors to First Champaign Corporation, Rantoul, Ill.
Filed Sep. 14, 1979, Ser. No. 75,671
Term of patent 14 years
Int. Cl. D03—*02*
U.S. Cl. D7—77

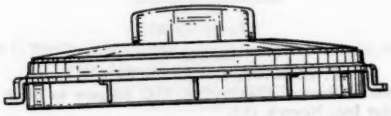


261,214
COMBINED BUTTER HOLDER DISH AND COVER
Alfred H. Oelzner, 1205 Leeds Ter., Baltimore, Md. 21227
Filed Jan. 2, 1979, Ser. No. 953,975
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—84



261,215
COFFEE URN LID
Leo A. Groh; Douglas D. Ludwig, both of West Bend, Wis.; David L. Painter, Glenview, Ill., and John H. Free, Kalispell, Mont., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Feb. 4, 1980, Ser. No. 118,121
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—131

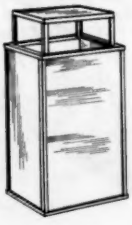




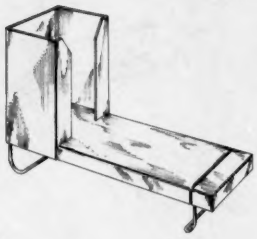
261,216
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Sep. 14, 1979, Ser. No. 75,639
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

261,217
DISH OR POT SCRAPER
Clyde E. Mutch, 5238 Mt. Alifan, San Diego, Calif. 92111
Filed Aug. 23, 1979, Ser. No. 68,974
Term of patent 14 years
Int. Cl. D07—*05*
U.S. Cl. D32—49

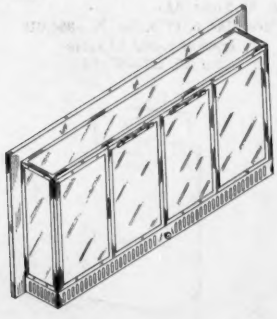
261,218
REFUSE CONTAINER
William A. Gilbert, Clayton, Mo., assignor to Clean City Squares, Inc., St. Louis, Mo.
Filed Mar. 6, 1978, Ser. No. 884,018
Term of patent 14 years
Int. Cl. D7—*07, 99*
U.S. Cl. D34—1



261,219
IRON HOLDER
Margaret D. Latimer, 1828 Ceres Way, Sacramento, Calif. 95825
Filed Jun. 20, 1979, Ser. No. 50,450
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D32—73

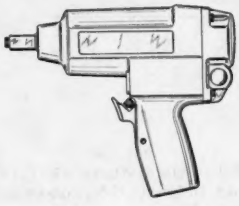


261,220
FIRE SCREEN
Ralph E. Matthews, Decatur, Ala., assignor to Matthews Machine Co., Inc., Decatur, Ala.
Filed Apr. 23, 1979, Ser. No. 32,718
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208

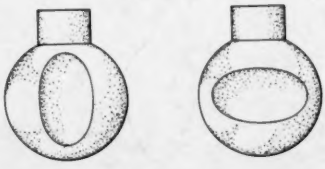


261,221
UNDERSIDE WICK HAND-HELD ROPE WICK APPLICATOR
Ricks H. Pluenneke, Rte. 7, Box 441E, Ft. Worth, Tex. 76119
Continuation-in-part of Ser. No. 156,086, Jun. 3, 1980. This application Oct. 31, 1980, Ser. No. 202,753
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—02

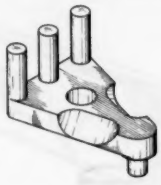
261,222
PNEUMATIC IMPACT WRENCH
Roderick F. Bunyea, Cockeysville, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Aug. 8, 1979, Ser. No. 64,964
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—68



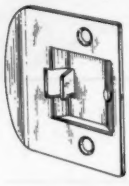
261,223
DOOR KNOB
Winfried Scholl, Düsseldorf, Fed. Rep. of Germany, assignor to HEWI, Heinrich Wilke GmbH, Fed. Rep. of Germany
Filed Aug. 7, 1979, Ser. No. 64,564
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1979, MR89
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—312



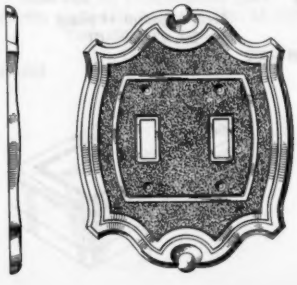
261,224
PIVOT PIN FOR MOVABLE LOUVERS OR THE LIKE
Paul H. Sanderson, Jr., Lewisville, Tex., assignor to Dowco Corporation, Dallas, Tex.
Filed Mar. 19, 1979, Ser. No. 21,616
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—323



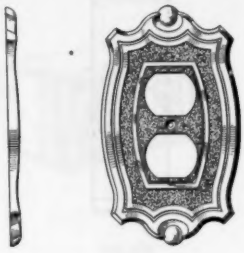
261,225
STRIKE PLATE
John G. Sterling, 888 Country Club Rd., Crystal Lake, Ill. 60014
Filed May 29, 1979, Ser. No. 42,860
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—344



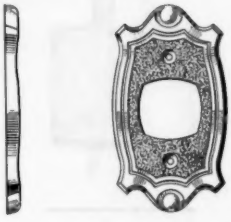
261,226
WALL PLATE FOR DOUBLE ELECTRIC SWITCH
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,359
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350



261,227
WALL PLATE FOR DOUBLE ELECTRIC SOCKET
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,360
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350



261,228
WALL PLATE
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Apr. 4, 1980, Ser. No. 137,363
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350



261,229
QUICK RELEASE HONDA
Daniel A. Dvorsky, Rte. 2, Box 106-D, Conifer, Colo. 80433
Filed Jan. 29, 1979, Ser. No. 7,665
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—396

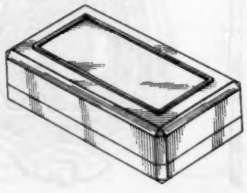
261,230
BOTTLE
John J. Bird, 1725 Glenoaks, San Fernando, Calif. 91340
Filed Jun. 25, 1979, Ser. No. 51,418
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—367

261,231
BOTTLE OR SIMILAR ARTICLE
John A. Grip, Cheesequake, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Feb. 21, 1979, Ser. No. 13,774
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

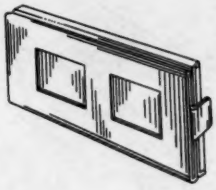
261,232
BOTTLE AND CAP OR SIMILAR ARTICLE
John A. Grip, Cheesequake, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Feb. 21, 1979, Ser. No. 13,775
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

261,233
CONTAINER FOR LIQUIDS OR THE LIKE
Marianne C. Green, Midland, Mich., assignor to Koehring Company, Brookfield, Wis.
Division of Ser. No. 835,418, Sep. 21, 1977, Pat. No. Des. 254,234, which is a division of Ser. No. 552,702, Feb. 24, 1975, Pat. No. Des. 246,891. This application Jun. 29, 1979, Ser. No. 53,380
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—398

261,234
COMBINED BOX AND LID
Anthony S. Abraham, Stanmore, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Sep. 5, 1979, Ser. No. 72,855
Claims priority, application United Kingdom, Mar. 7, 1979, 988896/79
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—432

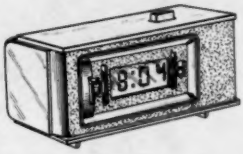


261,235
COLLAPSIBLE HANDLE
Robert G. McMullan, Oakville, Canada, assignor to SCM (Canada) Limited, Don Mills, Canada
Filed Feb. 8, 1979, Ser. No. 10,388
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—434



261,236
CLOSURE ASSEMBLY FOR LIQUID CONTAINER
Robert P. Williams, Kingswood, Australia, assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jan. 29, 1979, Ser. No. 7,084
Claims priority, application Australia, Oct. 13, 1978, 76355
Term of patent 7 years
Int. Cl. D9—*07*
U.S. Cl. D9—435

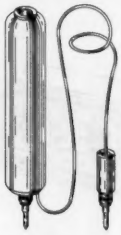
261,237
DIGITAL CLOCK OR THE LIKE
David K. Haufe, Hinsdale, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Division of Ser. No. 794,904, May 9, 1977, Pat. No. Des. 256,676. This application Sep. 28, 1979, Ser. No. 79,688
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



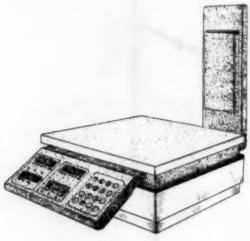
261,238
ADJUSTABLE BATTER BOARD
James K. Pitt, 1712 S. Walnut, Pittsburg, Kans. 66762
Filed May 3, 1979, Ser. No. 35,527
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—61

261,239
DUAL SIZE BRAKE SHOE APERTURE GAUGE
Thomas E. Morgan, 11061 Clinton River Dr., Sterling Heights, Mich. 48078
Filed Jan. 18, 1980, Ser. No. 113,408
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

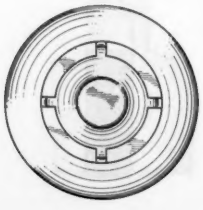
261,240
BATTERY TESTER
Gary W. Vest, and James C. Loase, both of Cleveland, Ohio, assignors to New Era Products, Inc., Cleveland, Ohio
Filed Jun. 28, 1979, Ser. No. 53,047
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—77



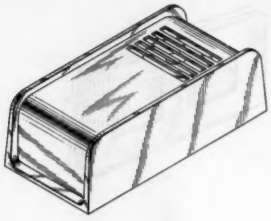
261,241
SCALE
Edward Lawing, Columbus, Ohio, assignor to Reliance Electric Co., Cleveland, Ohio
Filed Aug. 30, 1979, Ser. No. 71,313
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91



261,242
HOUSING FOR AN EMERGENCY ALARM FOR SWIMMING POOLS AND THE LIKE
Hendrik J. G. Lorist, 791 Cornell Dr., Santa Clara, Calif. 95050
Filed May 14, 1979, Ser. No. 38,632
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

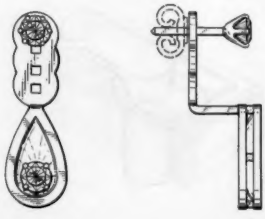


261,243
WATER SENSING ALARM
Richard P. Mintz, Oceanside; Ronald A. Buttner, Bellmore, and Alton K. Allen, Great Neck, all of N.Y., assignors to Datasonic, Inc., Mineola, N.Y.
Filed Dec. 3, 1979, Ser. No. 99,864
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121

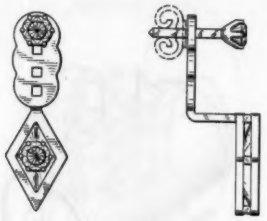


261,244
INTERLOCKING WEDDING BAND
Vito A. Scola, 139 Baker St., Providence, R.I. 02905
Filed Apr. 14, 1980, Ser. No. 139,977
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—27

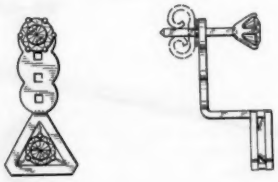
261,245
EARRING
Elias Epstein, Flushing, N.Y., assignor to Kaspar & Esh, Inc., New York, N.Y.
Filed Jan. 4, 1980, Ser. No. 109,525
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75



261,246
EARRING
Elias Epstein, Flushing, N.Y., assignor to Kaspar & Esh, Inc., New York, N.Y.
Filed Jan. 4, 1980, Ser. No. 109,526
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75



261,247
EARRING
Elias Epstein, Flushing, N.Y., assignor to Kaspar & Esh, Inc., New York, N.Y.
Filed Jan. 4, 1980, Ser. No. 109,609
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75



261,248
ORNAMENT PREFORM
Joan T. Birmingham, 2989 N. Garden Dr., San Bernardino, Calif. 92404
Filed May 27, 1980, Ser. No. 153,533
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—121

261,249
CREATURE ORNAMENT
Joan T. Birmingham, 2989 N. Garden Dr., San Bernardino, Calif. 92404
Filed May 27, 1980, Ser. No. 153,534
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

261,250
CREATURE ORNAMENT
Joan T. Birmingham, 2989 N. Garden Dr., San Bernardino, Calif. 92404
Filed May 27, 1980, Ser. No. 153,535
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—128

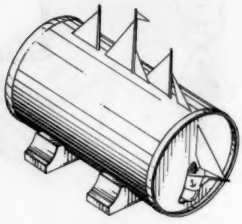
261,251
DESK ORNAMENT
Arthur E. Lange, 222 11th Ave. North, and Roger F. Bautch, 235 11th Ave. North, both of Waite Park, Minn. 56387
Filed Aug. 29, 1979, Ser. No. 70,917
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

261,252
FIGURINE OF A BULLDOG
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Mar. 9, 1979, Ser. No. 19,227
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

261,253
FIGURINE OF A LYNX
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Dec. 15, 1978, Ser. No. 970,007
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

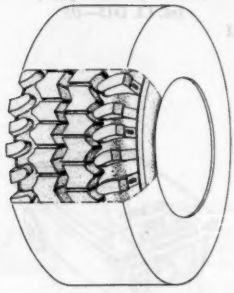
261,254
FIGURINE OF A POODLE
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Dec. 15, 1978, Ser. No. 970,008
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

261,255
MODEL SHIP
William R. Ervin, 7011 Pinefield Dr., Orlando, Fla. 32809
Filed Mar. 25, 1980, Ser. No. 133,794
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—163



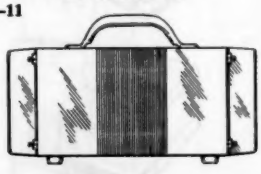
261,256
VEHICLE TIRE
Naoki Yamazaki, Kodaira; Hiroshi Kojima, Hino, and Hideaki Nishio, Kunitachi, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan
Filed Dec. 19, 1978, Ser. No. 971,127
Claims priority, application Japan, Oct. 28, 1978, 53-45612
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—148

261,257
TIRE
Warren L. Guidry, Rayne, La., assignor to Interco Marketing, Incorporated, Rayne, La.
Filed Mar. 30, 1979, Ser. No. 25,576
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

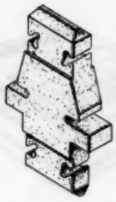


261,258
ADJUSTABLE VIEWING MIRROR
Patricia S. Lavanhar, 1776 Elmwood Dr., Highland Park, Ill. 60035
Filed Feb. 5, 1979, Ser. No. 9,509
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—189

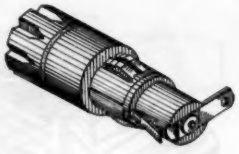
261,259
UNITIZED POWER CONVERTOR
Henry A. Swartz, 436 N. Rockwell, Oklahoma City, Okla. 73127
Filed Jul. 3, 1979, Ser. No. 54,504
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—11



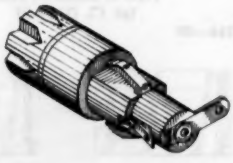
261,260
INSULATOR FOR AN OPEN-COIL ELECTRIC HEATING ELEMENT
Wayne R. Seeley, Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 22, 1979, Ser. No. 86,937
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—18



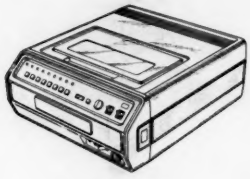
261,261
FUSE HOLDER
John C. Linton, Potomac, Md., assignor to FIC Corporation, Rockville, Md.
Filed May 24, 1979, Ser. No. 42,075
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



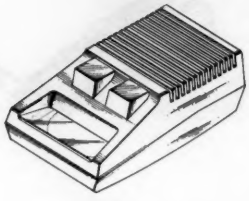
261,262
FUSE HOLDER
John C. Linton, Potomac, Md., assignor to FIC Corporation, Rockville, Md.
Filed May 24, 1979, Ser. No. 42,076
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



261,263
VIDEO TAPE RECORDER DECK
Koya Kurokawa; Noriyuki Arai; Hideo Takahashi, and Taisuke Saeki, all of Saijyo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Mar. 7, 1979, Ser. No. 18,392
Claims priority, application Japan, Sep. 7, 1978, 53/38172
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—2

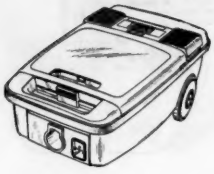


261,264
CASING FOR A MICROPHONOGRAPH
Bruce P. Carey, Saugus; Lloyd Y. Ishimaru, Agoura, and Moto Shimano, Los Angeles, all of Calif., assignors to Microsonics Corporation, Los Angeles, Calif.
Filed Aug. 10, 1977, Ser. No. 823,542
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—14

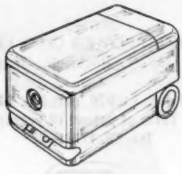


261,265
TELEPHONE NOTE HOLDER, OR THE LIKE
Norbert Leopoldi, 4180 Marine Dr., Chicago, Ill. 60613
Filed Feb. 19, 1980, Ser. No. 122,250
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

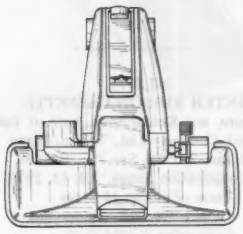
261,266
VACUUM CLEANER
Toshihiko Yoshida, Suita; Masakazu Tatsumi; Seiichi Sakakibara, both of Hirakata; Toshiki Kubo, Kobe; Tsugio Akita, Osaka, and Yoshiaki Ueda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jan. 23, 1980, Ser. No. 114,528
Claims priority, application Japan, Oct. 8, 1979, 54-42524
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



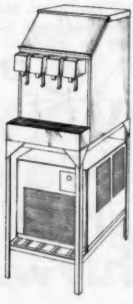
261,267
VACUUM CLEANER
Niklaus Hug, Romanshorn, Switzerland, assignor to Rommag P. Wörwag & Co., Romanshorn, Switzerland
Filed Dec. 29, 1978, Ser. No. 974,530
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1978, 636
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



261,268
MOTOR HOUSING AND RUG NOZZLE FOR A VACUUM CLEANER
Sheldon Rutter, New York, N.Y., assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Jan. 21, 1980, Ser. No. 114,067
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—32

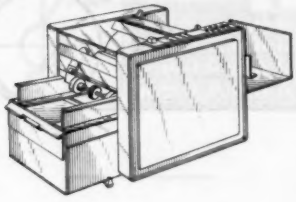


261,269
COMBINED DISPENSER CABINET AND STAND
Donald F. Cornett, Cartersville, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Mar. 4, 1980, Ser. No. 127,055
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—116

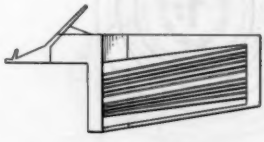


261,270
COMBINED SWIMMING POOL COVER-ROLLER AND BRAKE
Alfred D. Jeffrey, 9 Delaware St., Epping, New South Wales 2121, Australia
Filed Aug. 30, 1978, Ser. No. 938,123
Claims priority, application Australia, Mar. 1, 1978, 74142
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199

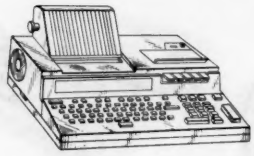
261,271
DUPLICATING APPARATUS
Casimir S. Samczyk, Itasca, Ill., assignor to White Consolidated Industries, Inc., Cleveland, Ohio
Filed Jul. 31, 1978, Ser. No. 929,386
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



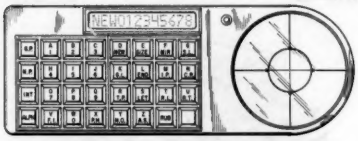
261,272
SORTING APPARATUS
Frederick J. Lawrence, Tustin, Calif., assignor to Gradco/Dendoki, Inc., Calif.
Filed Sep. 24, 1979, Ser. No. 78,398
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—32



261,273
DESK TOP ELECTRONIC CALCULATOR
Masaaki Sakai, Tokyo, and Sakae Uematsu, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Japan
Filed Jun. 28, 1979, Ser. No. 52,986
Claims priority, application Japan, Jan. 25, 1979, 54-2564
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



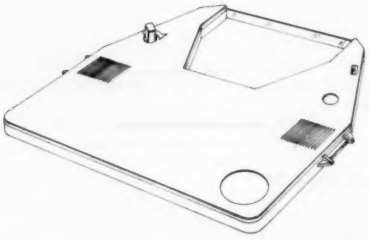
261,274
DIGITIZER CURSOR FOR COMPUTER DRAFTING
Gregg P. Gobeli, Plano, Tex., assignor to Camsco, Inc., Richardson, Tex.
Filed Aug. 24, 1979, Ser. No. 69,492
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



261,275
DISK FOR A MENSTRUAL CALENDAR
Kurt Christensen, Abildgaardsparken 29, 3460 Birkeroed, Denmark
Filed Jan. 24, 1979, Ser. No. 6,191
Claims priority, application Denmark, Jul. 24, 1978, 581
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—10

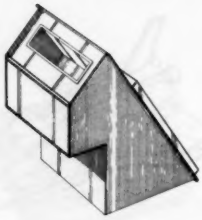
261,276
CASH REGISTER ATTACHMENT FOR SCREENING KEYS
William B. Denker, Fridley, and Jeanne C. Frank, Minneapolis, both of Minn., assignors to Red Owl Stores, Inc., Hopkins, Minn.
Filed Feb. 26, 1979, Ser. No. 15,457
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—12

261,277
PRINTER RIBBON CASSETTE
Masanori Hashimoto, and Koichi Soda, both of Tokyo, Japan, assignors to Ricoh Company Ltd., Tokyo, Japan
Filed Jan. 2, 1980, Ser. No. 109,059
Claims priority, application Japan, Jul. 13, 1979, 54-29244
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—12

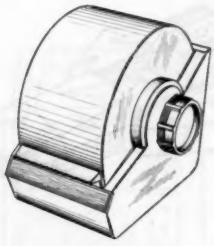


261,278
FONT OF VEGETABLE SCRIPT
Willi Rieser, Kloten, Switzerland, assignor to Pfanni-Werk Otto Eckart KG, Munich, Fed. Rep. of Germany
Filed Jan. 22, 1979, Ser. No. 5,481
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, MR 11421; Jul. 21, 1978, MR 11423
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—27

261,279
SOLAR DEMONSTRATION UNIT
Walter H. Barrett, Woonsocket, R.I., assignor to Columbia Chase Corporation, Braintree, Mass.
Filed Dec. 21, 1978, Ser. No. 971,947
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62

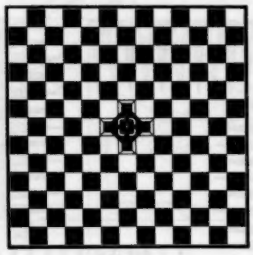


261,280
ROTARY CARD FILE
Albrecht Goertz, Nassau, The Bahamas, assignor to Rolodex Corporation, Secaucus, N.J.
Continuation-in-part of Ser. No. 757,514, Jan. 7, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,218
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

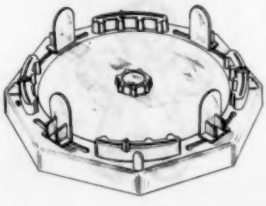


261,281
LAWN SIGN
Christopher L. McDonald, 28444 Joy Rd., Livonia, Mich. 48150
Filed Jan. 19, 1979, Ser. No. 4,723
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—38

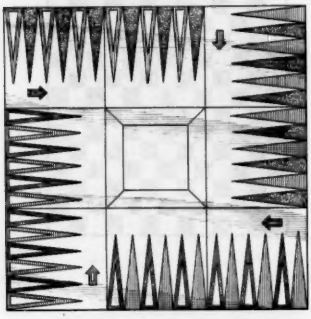
261,282
GAME BOARD
Enoch E. Hicks, 3727 Pittsburgh Ave., Dayton, Ohio 45406
Filed Aug. 13, 1979, Ser. No. 66,157
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—24



261,283
GAME BOARD
James R. Becker, New York; David D. Austin, Rochester, both of N.Y., and Ronald A. Rudat, Attleboro, Mass., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Aug. 27, 1979, Ser. No. 70,306
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—33

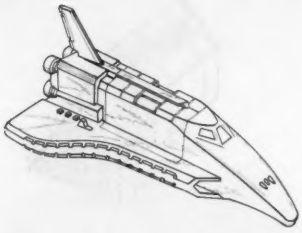


261,284
BACKGAMMON GAMEBOARD (I)
Robert M. Thomas, 2970 Mendon Rd.-15, Cumberland, R.I. 02864, and Robert E. Thomas, R.D.-3 Acorn St., Stanhope, N.J. 07874
Filed Aug. 6, 1979, Ser. No. 64,347
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D21—34

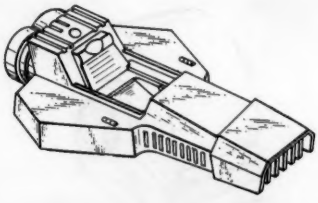


261,285
GINGERBREAD MAN RATTLE
Robin Clark, Kenley, England, assignor to Hilary Page "Sensible" Toys Limited, Kenley, England
Filed Sep. 5, 1979, Ser. No. 72,605
Claims priority, application United Kingdom, Mar. 16, 1979, 989079/79
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—65

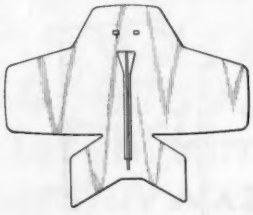
261,286
TOY SPACE SHUTTLE
Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 22, 1980, Ser. No. 114,277
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87



261,287
TOY SPACE ROCKET
Steven E. Hilko, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 22, 1980, Ser. No. 114,280
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—87

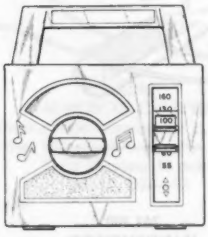


261,288
TOY GLIDER
Steven E. Hilko, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 10, 1979, Ser. No. 101,803
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—89



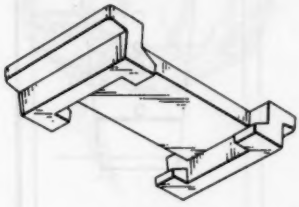
261,289
COMBINED CASH REGISTER AND BAR CODE READER TOY
Palmer J. Schoenfield, Evanston, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Feb. 12, 1980, Ser. No. 120,864
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—111

261,290
TOY RADIO
Paul D. Snyder, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Oct. 17, 1979, Ser. No. 85,692
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—113



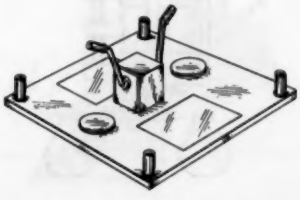
261,291
SIMULATIVE TOY VEHICLE
Donald C. Wilson, 18085 Birchcrest, Detroit, Mich. 48221
Continuation-in-part of Ser. No. 894,198, Apr. 5, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,556
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—128

261,292
CLIP FOR TOY RAILWAY TRACK
Duncan Tong, Hong Kong, Hong Kong, assignor to Playart Limited, Hong Kong, Hong Kong
Filed Mar. 29, 1979, Ser. No. 25,130
Claims priority, application United Kingdom, Nov. 29, 1978, 987465/78
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—143

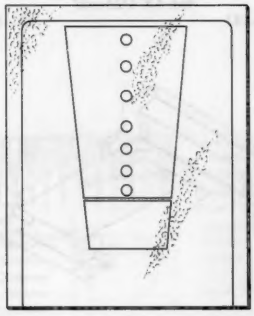


261,293
JACK-IN-THE-BOX TOY
Donald H. Samuels, Warwick, and Brian L. Newton, Woonsocket, both of R.I., assignors to Hasbro Industries, Inc., Pawtucket, R.I.
Filed Feb. 15, 1979, Ser. No. 12,359
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—151

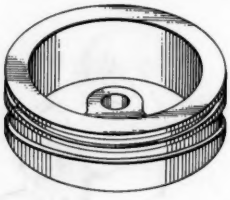
261,294
ARM WRESTLING DEVICE
Sterling A. Clink, 1930 Maxwell Ave., and Jack E. Barringer, 1313 Ontario Cir., both of Ames, Iowa 50010
Filed Sep. 8, 1978, Ser. No. 940,578
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—195



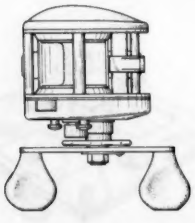
261,295
INDOOR/OUTDOOR GOLF PRACTICE TARGET
James Todd, 24 Casey La., East Northport, N.Y. 11731
Filed Nov. 5, 1979, Ser. No. 78,009
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



261,296
PULLEY FOR COMPOUND ARCHERY BOWS
Joseph M. Caldwell, 2259 W. Big Tujunga Canyon, Tujunga, Calif. 91042
Filed Jan. 28, 1980, Ser. No. 115,955
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—5

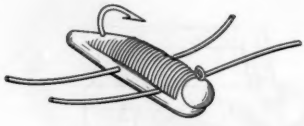


261,297
FISHING REEL
Masakazu Sakamoto, and Takeshi Shohoji, both of Fukuyama, Japan, assignors to Ryobi, Ltd., Fuchu, Japan
Filed Dec. 4, 1979, Ser. No. 100,151
Claims priority, application Japan, Jul. 24, 1979, 54-31206
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

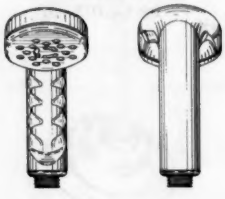


261,298
FISHING LURE
Lester M. Davis, 10805 36 NW., Gig Harbor, Wash. 98335
Filed Apr. 23, 1979, Ser. No. 32,245
Term of patent 14 years
Int. Cl. D22—*27*
U.S. Cl. D22—27

261,299
FISHING LURE
James E. Easterday, R.R. #1, Spencer, Ind. 47460
Filed Mar. 14, 1980, Ser. No. 130,457
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



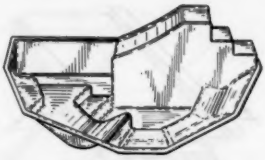
261,300
HANDSHOWER
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Friedrich Grohe Armaturenfabrik GmbH & Co., Hemer, Fed. Rep. of Germany
Filed May 23, 1979, Ser. No. 41,695
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1978, MR 6891
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



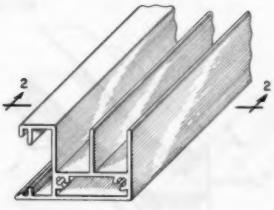
261,301
DENTAL HANDPIECE
N. Dominic Marucci, Philadelphia, and David B. Wright, Wayne, both of Pa., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Filed Sep. 29, 1978, Ser. No. 947,123
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—12

261,302
SURGICAL CALIPER
Michael R. Wheeler, 4448 Lennington Ct., Flint, Mich. 48503
Filed Mar. 5, 1979, Ser. No. 17,399
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26

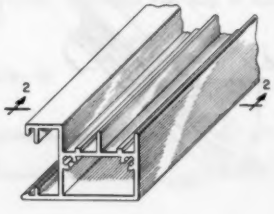
261,303
HYDROTHERAPY POOL WITH SLIDE
John L. Haller, 7249 Carrizo Dr., La Jolla, Calif. 92037
Filed Jul. 18, 1979, Ser. No. 58,746
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—38



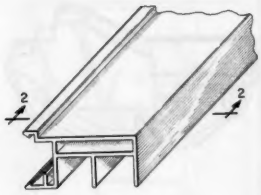
261,304
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,561
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



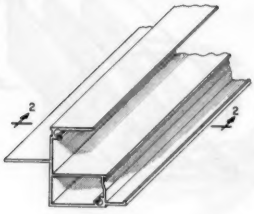
261,305
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,562
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



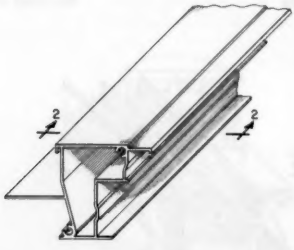
261,306
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,563
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



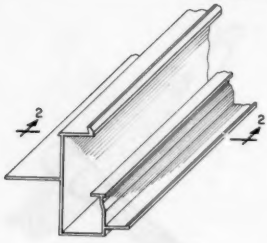
261,307
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,564
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



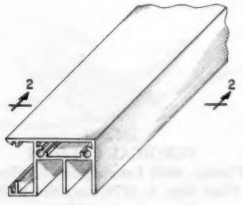
261,308
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,565
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



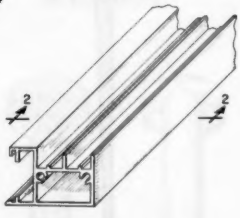
261,309
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,566
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



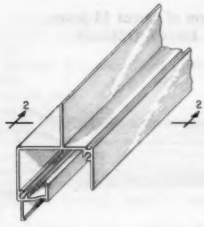
261,310
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,567
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



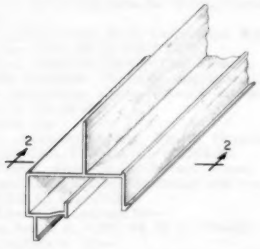
261,311
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,568
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



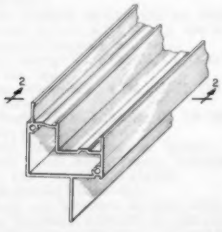
261,312
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,641
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



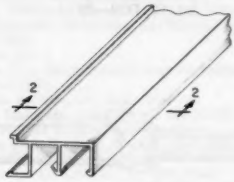
261,313
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,794
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—74



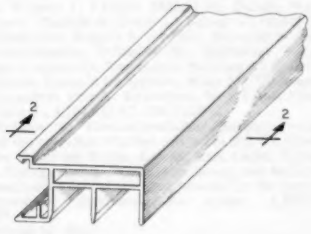
261,314
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 21, 1980, Ser. No. 113,795
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,315
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 24, 1980, Ser. No. 115,085
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,316
FRAME MEMBER FOR WINDOWS OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Jan. 24, 1980, Ser. No. 115,086
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



261,317
COMBINED CURLING IRON WITH COVER
Robert Oberheim, Liederbach; Jürgen Greubel, Heidenrod, and Dieter Rams, Kronberg, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Fed. Rep. of Germany
Filed Jun. 19, 1980, Ser. No. 158,837
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 8842
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35

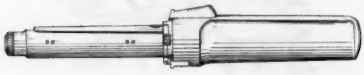
261,318
CURLING IRON
Robert Oberheim, Liederbach; Jürgen Greubel, Heidenrod, and Dieter Rams, Kronberg, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jun. 19, 1980, Ser. No. 158,838

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 8842

Term of patent 14 years
Int. Cl. D28—*03*

U.S. Cl. D28—35



261,319
COVER FOR A CURLING IRON
Robert Oberheim, Liederbach; Jürgen Greubel, Heidenrod, and Dieter Rams, Kronberg, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jun. 19, 1980, Ser. No. 158,839

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1980, 8842

Term of patent 14 years
Int. Cl. D28—*03*

U.S. Cl. D28—35

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See—*
Kamp, Eugene L., 4,295,024, Cl. 200-288.000.

A-T-O, Inc.: *See—*
Winiasz, Michael E.; and Long, James M., 4,294,057, Cl. 53-244.000.

Abbott Laboratories: *See—*
Williams, John W.; Smith, Robert A.; and Arbir, Francis W., 4,294,853, Cl. 424-319.000.

Abe, Kazunobu; Tamura, Shoichi; and Nakatsuji, Tadao, to Sakai Chemical Industry Co., Ltd. Method for preventing the wear of a monolithic catalyst by dusts. 4,294,806, Cl. 423-239.000.

Abler, William L. Bi-periscopic instrument for use in determining terrestrial positions through celestial observation. 4,294,541, Cl. 356-145.000.

Abo, Toshimi; and Hosaka, Akio, to Nissan Motor Company, Limited. Air fuel ratio controlling device. 4,294,216, Cl. 123-489.000.

Abramowitz, Herbert. Dental mirror protector case. 4,294,356, Cl. 206-368.000.

Acher, Jacques: *See—*
Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, 4,294,828, Cl. 424-232.000.

Achiha, Masahiko: *See—*
Hata, Hidetoh; Haji, Katsumi; Sako, Kazushige; Shibata, Yoji; and Achiha, Masahiko, 4,295,154, Cl. 358-4.000.

AD.ELE. -Advanced Electronics- S.R.L.: *See—*
Bonori, Maurizio; and Franconi, Cafiero, 4,295,131, Cl. 340-554.000.

Ad-Tec Products, Inc.: *See—*
Whelan, James P., 4,294,701, Cl. 210-497.200.

Adachi, Akiyoshi: *See—*
Hara, Haruichi; Kanzaki, Toshihide; Motomuro, Hisanao; and Adachi, Akiyoshi, 4,294,723, Cl. 252-440.000.

Adam, Fritz G., to ITT Industries, Inc. Storage transistor. 4,295,150, Cl. 357-54.000.

Adam, Jean-Marie, to Ciba-Geigy Corporation. Water-soluble anthraquinone dyes. 4,294,768, Cl. 260-372.000.

Adin, Anthony; Boettcher, John W.; and Fleming, James C., to Eastman Kodak Company. Thermally responsive cobalt(III) complex imaging compositions having lowered activation temperatures. 4,294,912, Cl. 430-341.000.

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Maurer, Alexander; Adrian, Renate; Hestermann, Klaus; and Heymer, Gero, 4,294,621, Cl. 106-306.000.
Wasel-Nielen, Horst-Dieter; Adrian, Renate; Panter, Herbert; Heymer, Gero; Maurer, Alexander; and von Schenck, Raban, 4,294,808, Cl. 423-305.000.

Advanced Circuit Technology: *See—*
Roberts, Joseph A., 4,295,184, Cl. 361-406.000.

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Asinovsky, Erik I.; Afanasiev, Anatoly A.; Pakhomov, Evgeny P.; Zeigarnik, Vladimir A.; and Yartsev, Ivan M., 4,295,021, Cl. 200-147.00R.

AGA Aktiebolag: *See—*
Wiklund, Klas R., 4,295,201, Cl. 364-561.000.

Agence Nationale de Valorisation de la Recherche (Anvar): *See—*
Bernard, Claude, 4,294,258, Cl. 128-635.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Helling, Gunter; Saleck, Wilhelm; and Bergthaller, Peter, 4,294,920, Cl. 430-569.000.

Ahlstone, Arthur G., to Vetco Inc. Flexible ring gasket retainer for flanged connectors. 4,294,477, Cl. 285-336.000.

Aida Engineering, Ltd.: *See—*
Takahashi, Yuu, 4,294,170, Cl. 100-216.000.

Ainsworth, Bobby J. Attachment for windshield wiper blades. 4,293,975, Cl. 15-250.410.

Air Industrie: *See—*
Schlicklin, Philippe; Mertzweiller nee Maillard, Anne-Marie; and Ploussard, Jacques, 4,294,617, Cl. 106-14.370.

Air Products and Chemicals, Inc.: *See—*
Kalwaitis, George V., 4,294,124, Cl. 73-863.850.

Air Shields, Inc.: *See—*
Hochman, Benjamin L., 4,294,263, Cl. 128-736.000.

Airco, Inc.: *See—*
Nayar, Harbhajan S., 4,294,395, Cl. 228-220.000.

Aisan Industry Co., Ltd.: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Mori, Keiji; and Kurimoto, Kyoichi, 4,294,134, Cl. 74-547.000.
Nomura, Yoshihiko, 4,294,325, Cl. 180-148.000.
Ohumi, Takeharu, 4,294,286, Cl. 137-625.480.

Ajinomoto Company, Incorporated: *See—*
Takahara, Yoshiyuki; Hirose, Yoshiteru; Takeuchi, Yoko; Murai, Asao; Kainosho, Masatsune; and Murao, Sawao, 4,294,754, Cl. 260-112.50R.

Akagi, Susumu: *See—*
Taniguchi, Eiji; Akagi, Susumu; and Torimitsu, Seiichi, 4,294,939, Cl. 525-118.000.

Akebono Brake Industry Co., Ltd.: *See—*
Maehara, Toshifumi, 4,294,335, Cl. 188-71.900.

Aktiebolaget Svenska Elektromagneter: *See—*
Johansson, Sven H., 4,295,070, Cl. 310-70.00R.

Akzona Incorporated: *See—*
Allen, Thomas C., 4,294,731, Cl. 260-17.4CL.

Alape, William J., to Aquascooter Inc. Carburetor device. 4,294,779, Cl. 261-35.000.

Albano, Vincent J.: *See—*
Oztekin, Muammer A.; and Albano, Vincent J., 4,294,363, Cl. 211-49.00D.

Albers-Schonberg, George; Joshua, Henry; and Lopez, Maria B., to Merck & Co., Inc. Hypocholesteremic fermentation products and products of preparation. 4,294,846, Cl. 424-279.000.

Albers-Schonberg, George: *See—*
Monaghan, Richard L.; Alberts, Alfred W.; Hoffman, Carl H.; and Albers-Schonberg, George, 4,294,926, Cl. 435-125.000.

Alberts, Alfred W.: *See—*
Monaghan, Richard L.; Alberts, Alfred W.; Hoffman, Carl H.; and Albers-Schonberg, George, 4,294,926, Cl. 435-125.000.

Albizzati, Enrico: *See—*
Cecchin, Giuliano; and Albizzati, Enrico, 4,294,721, Cl. 252-429.00B.

Alcan Research and Development Limited: *See—*
Deczky, Andrew E., 4,294,682, Cl. 204-244.000.

Alexandrov, Petr A.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Alfenaar, Marinus, to Electrochemische Energieconversie, N.V. Method for the operation of a fuel cell. 4,294,892, Cl. 429-13.000.

Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, to Gyogyszerkutato Intezet. Genetic process for the preparation of antibiotic-producer micromonospora strains. 4,294,927, Cl. 435-172.000.

Alford, Raymond N.: *See—*
Treible, Edwin S.; Dopkin, Joseph A.; and Alford, Raymond N., 4,294,214, Cl. 123-458.000.

Allen, Thomas C., to Akzona Incorporated. Method for drying absorbent modified cellulosic polymers and the like. 4,294,731, Cl. 260-17.4CL.

Allied Chemical Corporation: *See—*
Frantom, Richard L., 4,294,467, Cl. 280-801.000.

Alligator Ventilfabrik GmbH: *See—*
Lutz, Sepp, 4,294,301, Cl. 152-427.000.

Alpha Plastics, Inc.: *See—*
Rogers, William H., 4,294,385, Cl. 224-240.000.

Alps Electric Co., Ltd.: *See—*
Kasashima, Masao; and Kubo, Yoshizo, 4,295,119, Cl. 338-162.000.

Altschuler, Bruce R.; Taboada, John; and Altschuler, Martin D. Topographic comparator. 4,294,544, Cl. 356-376.000.

Altschuler, Martin D.: *See—*
Altschuler, Bruce R.; Taboada, John; and Altschuler, Martin D., 4,294,544, Cl. 356-376.000.

Aluminum Company of America: *See—*
Dawless, Robert K.; and Graziano, Robert E., 4,294,612, Cl. 75-68.00R.

Amako, Hiroshi: *See—*
Yamamoto, Takashi; and Amako, Hiroshi, 4,294,667, Cl. 204-1.00T.

Amano, Sayoko: *See—*
Ito, Susumu; Sugawara, Noboru; and Amano, Sayoko, 4,294,890, Cl. 428-641.000.

Ambrus, Gabor: *See—*
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.

Amemori, Hiroyuki; and Yamada, Masao, to Tokico Ltd. Turbine meter. 4,294,123, Cl. 73-861.920.

Amer, Myron: *See*—
Froehlig, Guy M., 4,294,782, Cl. 264-1.400.
American Cyanamid Co.: *See*—
Spatz, David M.; and Cross, Barrington, 4,294,986, Cl. 564-52.000.
American Institute of Baking, The: *See*—
Kulp, Karel; and Hoover, William J., 4,294,864, Cl. 426-549.000.
American Optical Corporation: *See*—
Grovesteen, William R.; and Jones, John A., 4,294,599, Cl. 55-485.000.
LeBoeuf, Albert R., 4,294,974, Cl. 556-440.000.
American Standard Inc.: *See*—
Fischer, Armin O., 4,294,289, Cl. 138-44.000.
American Sterilizer Company: *See*—
Baran, Walter J., 4,294,804, Cl. 422-112.000.
Ames, Geoffrey C., to Owens-Illinois, Inc. Plastic drum assembly. 4,294,374, Cl. 220-71.000.
Amino Aluminium Industries, Co., Ltd.: *See*—
Matsuno, Ryohei, 4,294,435, Cl. 266-234.000.
Ammons, Staron E.; Paschall, Edwin L.; and Carter, Morris G. System and method for controlling the conditioning and delivery of air to a conditioned space. 4,294,403, Cl. 236-13.000.
Amoroso, Michael J., to M.A.T. Industries, Inc. Drillhead unit. 4,294,317, Cl. 173-57.000.
AMP Incorporated: *See*—
Weidler, Charles H., 4,295,009, Cl. 179-110.00A.
Anderson, Dale L., to Datafile Limited. Servo motor control labeller. 4,294,644, Cl. 156-361.000.
Anderson, Kenneth W.; Summerhays, Brent; and Cazier, Verl O., to Electronic Systems Engineering, Inc. Beverage flow switch. 4,295,044, Cl. 250-229.000.
Anderson, Norman; Peak, Richard; and Moyse, James A., to Imperial Chemical Industries Limited. Spin finish with anti-static agent. 4,294,709, Cl. 252-8.800.
Ando, Haruhisa: *See*—
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.
Ando, Tsuneo: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.
Andresen, Donald D. Honeycomb overhead door. 4,294,055, Cl. 52-795.000.
Andrews, William J.; Espley, David J. C.; and Philpott, William J. M., to British Cellophane Limited. Heat-sealable antistatic polypropylene films. 4,294,882, Cl. 428-349.000.
Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., to Du Pont de Nemours, E. I., and Company. Upholstered furniture having improved flame resistance. 4,294,489, Cl. 297-452.000.
Anthonis, Henry E., to General Refractories Company. Silica-doped, chrome-alumina monolithic refractory compositions. 4,294,618, Cl. 501-129.000.
Anthony, Myron L., to Sax Zzyzx, Ltd. Latent heat recirculating system. 4,294,664, Cl. 203-19.000.
Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. Surface corrosion inhibition of zirconium alloys by laser surface β-quenching. 4,294,631, Cl. 148-133.000.
Antonio, Christo; and Uhl, Wyman F., to Litton Business Systems, Inc. Release medium having transferrable glue lines. 4,294,888, Cl. 428-451.000.
Aoki, Kenji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio control method and apparatus of an internal combustion engine. 4,294,212, Cl. 123-440.000.
Aoki, Masakazu: *See*—
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, to Ebara Corporation. Method of treating waste gas by irradiation. 4,294,674, Cl. 204-157.10H.
Aono, Toshiaki, to Fuji Photo Film Co., Ltd. Process of producing multicolor optical filters. 4,294,900, Cl. 430-7.000.
Apple, Joseph; and Upton, Eric L., to Command Control & Communications Corporation. Optical system for developing point coordinate information. 4,294,543, Cl. 356-375.000.
Aquascooter Inc.: *See*—
Alape, William J., 4,294,779, Cl. 261-35.000.
Arai, Masatoshi: *See*—
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,294,975, Cl. 556-482.000.
Arbir, Francis W.: *See*—
Williams, John W.; Smith, Robert A.; and Arbir, Francis W., 4,294,853, Cl. 424-319.000.
Archer, Jean-Francois, to Stas Societe Technique d'Accessoires Specialises S.A. Safety lifting hooks. 4,294,479, Cl. 294-82.00R.
Archer, Ronald J.; and Fetterly, Richard V. Lint collecting system and apparatus. 4,294,597, Cl. 55-283.000.
Arco Industries Ltd.: *See*—
Tsui, Kwok W., 4,295,036, Cl. 235-1.00E.
Ariga, Shoji, to Clarion Co., Ltd. Packaging case. 4,294,354, Cl. 206-335.000.
Ariizumi, Takashi: *See*—
Okado, Masaru; and Ariizumi, Takashi, 4,294,094, Cl. 72-16.000.
Aristo Graphic Systeme GmbH & Co. KG: *See*—
Cordes, Werner, 4,295,146, Cl. 346-140.00R.
Ariyama, Kenzo; Miyawaki, Syozo; and Murakami, Takashi, to Ricoh Company, Ltd. Electrostatic copying apparatus. 4,294,535, Cl. 355-14.0SH.
Arizona Board of Regents, The University of Arizona, The: *See*—
Randolph, Alan D., 4,294,807, Cl. 423-242.000.
Armour and Company: *See*—
Lundquist, Burton R.; and Macherione, Thomas, 4,294,859, Cl. 426-410.000.
Armour Pharmaceutical Company: *See*—
Feldman, Fred, 4,294,826, Cl. 424-101.000.
Armstrong, Errol C.: *See*—
Cayton, David W.; Armstrong, Errol C.; and MacKenzie, Angus B., 4,294,179, Cl. 111-3.000.
Arndt, Friedrich; Rusch, Reinhard; and Schulz, Heinz, to Schering Aktiengesellschaft. Agents for the defoliation of plants. 4,294,605, Cl. 71-73.000.
Arons, Irving J.; Merrill, Richard E.; and Drennan, Arthur P., to Universal Optical Company, Inc. Molded plastic parts, particularly spin-cast plastic parts for eyeglass frames. 4,294,792, Cl. 264-311.000.
Arpino, Roberto. Method for transmitting airport weather information. 4,295,139, Cl. 340-870.010.
Asahi Breweries Ltd.: *See*—
Otsuka, Chikao; Hara, Reinosuke; and Shigenaka, Yoshito, 4,294,367, Cl. 215-246.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Issei, Katsuta; and Tetsuo, Tanaka, 4,294,665, Cl. 203-50.000.
Asai, Mitsuko, to Takeda Chemical Industries, Ltd. 20-O-Acylmaytansinoids. 4,294,757, Cl. 260-239.30P.
Asea Aktiebolag: *See*—
Bjorklund, Anders; Persson, Erik; and Virsberg, Lars-Goran, 4,295,113, Cl. 336-84.00M.
Ashida, Hiroshi; and Takahashi, Fumitake, to Sumitomo Electric Industries, Ltd. Apparatus for coating wires with paint. 4,294,189, Cl. 118-603.000.
Ashida, Kazutaka: *See*—
Hirota, Akira; Kosaka, Yoshiteru; and Ashida, Kazutaka, 4,295,171, Cl. 360-73.000.
Ashton, Charles R.: *See*—
Givan, David E.; and Ashton, Charles R., 4,295,069, Cl. 310-67.00R.
Ashworth, Denis H., to Simon Engineering Dudley Limited. Hydraulically operated access equipment. 4,294,188, Cl. 118-305.000.
Asinovsky, Erik I.; Afanasiev, Anatoly A.; Pakhomov, Evgeny P.; Zeigarnik, Vladimir A.; and Yartsev, Ivan M. Electromagnetic arc extinction apparatus for switchgear. 4,295,021, Cl. 200-147.00R.
Aslanian, Jerry L.; and Numbers, Jody L., to Master Medical Corporation. Flow control device for administration of intravenous fluids. 4,294,246, Cl. 128-214.00E.
Asselman, George A. A.: *See*—
Bex, Peter T. J.; and Asselman, George A. A., 4,294,139, Cl. 74-839.000.
Assmann, Jurgen, to Grossag GmbH. Hot air grill. 4,295,034, Cl. 219-400.000.
Astegiano, Luciano; and van Veen, Wouter M. D., to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A. Line identifier for switchboards. 4,295,007, Cl. 179-7.00R.
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, to BASF Aktiengesellschaft. Process for the manufacture of 4,4'-diphenyl-methane diisocyanate and a mixture of diphenyl-methane diisocyanate isomers containing a small amount of uretdiones and hydrolyzable chlorine. 4,294,666, Cl. 203-72.000.
Atkins, Larry P., to General Motors Corporation. Battery vent cap for preventing electrolyte foam escape. 4,294,895, Cl. 429-84.000.
Atlantic Richfield Company: *See*—
Grane, Henry R.; Jubin, John C., Jr.; and Worrell, G. Richard, 4,294,999, Cl. 568-910.000.
Pinaire, Ronald; and Everett, Gary L., 4,294,687, Cl. 208-58.000.
Aubusson, Russell C.; and Gledhill, Richard J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Interconnection arrangements for testing microelectronic circuit chips on a wafer. 4,295,182, Cl. 361-400.000.
Aulich, Hubert; and Graubmaier, Josef, to Siemens Aktiengesellschaft. Process for manufacturing Si useful for semiconductor components from quartz sand. 4,294,811, Cl. 423-350.000.
Ault, James R.: *See*—
Winzer, Frederick W.; and Ault, James R., 4,294,603, Cl. 65-346.000.
Ausserbauer, Valentin: *See*—
Pietralla, Norbert; Ausserbauer, Valentin; and Rosenthal, Christian, 4,294,771, Cl. 260-413.000.
Autelca AG: *See*—
Wuthrich, Werner, 4,294,553, Cl. 400-219.100.
Babcock & Wilcox Company, The: *See*—
Christiansen, David W., 4,294,660, Cl. 376-442.000.
Bach, Hartwig C.; and Hinderer, Helmuth E., to Monsanto Company. Acrylic fiber having improved basic dyeability and method for making the same. 4,294,884, Cl. 428-364.000.
Bagnall, Elizabeth A.; Guiliano, Basil A.; and Pfeffer, Henry A., III, to FMC Corporation. Continuous process for the manufacture of cyanuric acid. 4,294,962, Cl. 544-192.000.

Bahjat, Dhari S.: *See*—
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., 4,295,096, Cl. 324-357.000.

Bahrmann, Heinrich: *See*—
Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, 4,294,834, Cl. 424-260.000.

Bailey, William. Apparatus for assembling ladder-type frames. 4,293,991, Cl. 29-243.520.

Bair, Eugene C.; and Hopkins, Willard C., to General Electric Company. Automatic control for wire crimping machine. 4,294,006, Cl. 29-701.000.

Baird, Charles D. Cotton module compacter. 4,294,169, Cl. 100-48.000.

Bak, Johannes A.: *See*—
Nordstrom, Immo R.; and Bak, Johannes A., 4,294,185, Cl. 114-75.000.

Baker, Donal E.: *See*—
Stacey, Eric J.; and Baker, Donal E., 4,295,190, Cl. 363-162.000.

Baker, James A. Tool for removing casement window from building. 4,293,993, Cl. 29-278.000.

Baker, Joseph T.; Hoffler, George W.; and Hursta, William, to United States of America, National Aeronautics and Space Administration. Logic-controlled occlusive cuff system. 4,294,261, Cl. 128-691.000.

Baker Perkins Holdings Limited: *See*—
Naylor, Arthur V.; and Spencer, John K., 4,294,060, Cl. 53-506.000.

Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Poliak, Richard M., to International Business Machines Corporation. Composition containing alcohol and use thereof for epoxy removal. 4,294,729, Cl. 252-545.000.

Baldwin, John J.; and Ponticello, Gerald S., to Merck & Co., Inc. Process for producing 2-bromo-3,5-disubstituted pyridines. 4,294,969, Cl. 546-286.000.

Baldwin, Stanley L.; Hampton, Vernon; and Embleton, Tony F. W., to Inco Limited. Mufflers for percussive pneumatic machines. 4,294,330, Cl. 181-230.000.

Balint nee Fodor, Katalin: *See*—
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.

Balko, Edward N., to General Electric Company. High temperature and low feed acid concentration operation of HCl electrolyzer having unitary membrane electrode structure. 4,294,671, Cl. 204-128.000.

Ball Corporation: *See*—
Miller, Edward C.; and Straw, David A., 4,294,373, Cl. 220-70.000.

Ballester, Ricardo H.: *See*—
Thompson, Arthur H.; and Ballester, Ricardo H., 4,295,097, Cl. 324-429.000.

Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., to International Business Machines Corporation. Master image chip organization technique or method. 4,295,149, Cl. 357-45.000.

Ban, Mikichi, to Canon Kabushiki Kaisha. Image forming optical system. 4,294,538, Cl. 355-51.000.

Bando Chemical Industries, Ltd.: *See*—
Ueno, Toshihiko; and Tomogane, Teruhisa, 4,294,712, Cl. 252-12.000.

Banford, Samuel E. Athletic footwear for non-contact or light contact sports. 4,294,023, Cl. 36-11.500.

Banke, Horst: *See*—
Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, 4,294,947, Cl. 526-119.000.

Barach, Jeffrey T.; and Bluhm, Leslie, to Miles Laboratories, Inc. Process for improving the recovery of microbial cell biomass. 4,294,930, Cl. 435-261.000.

Baran, Walter J., to American Sterilizer Company. Pressure responsive conditioning control gas sterilization. 4,294,804, Cl. 422-112.000.

Barbarasch, Joseph: *See*—
Carollo, Jerome T.; and Barbarasch, Joseph, 4,295,159, Cl. 358-22.000.

Bard, Robert A. Upward vented trash receptacle for flexible collapsible trash liner. 4,294,379, Cl. 220-404.000.

Barker, John C.: *See*—
Turnbull, James O.; Barker, John C.; and Knight, Arthur J., 4,294,021, Cl. 34-224.000.

Barr, Rolla W. Security device for spare tires. 4,294,088, Cl. 70-56.000.

BASF Aktiengesellschaft: *See*—
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, 4,294,666, Cl. 203-72.000.
Hartmann, Juergen; Stedefeder, Joachim; Denzinger, Walter; and Pfohl, Sigberg, 4,294,873, Cl. 427-391.000.
Helfert, Herbert; Reinert, Friedrich; Richter, Paul; Vescia, Michele; and Wegerle, Dieter, 4,294,576, Cl. 8-137.500.
Kanter, Hartmut, 4,294,755, Cl. 260-154.000.
Koenig, Karl-Heinz; Feuerherd, Karl-Heinz; and Oeser, Heinz-Guenter, 4,294,773, Cl. 260-453.00P.
Mensch, Siegfried; Epple, Gerhard; and Elser, Wolfgang, 4,294,581, Cl. 8-611.000.
Merger, Franz; and Towae, Friedrich, 4,294,971, Cl. 548-226.000.
Sappok, Reinhard; and Kranz, Joachim, 4,294,620, Cl. 106-288.00Q.
Schmidt, Wolfram; and Paust, Joachim, 4,294,766, Cl. 260-343.600.

BASF Wyandotte Corporation: *See*—
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,294,944, Cl. 525-423.000.

Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, to Centro Ricerche Fiat S.p.A. Distributor-type injector pump, for multi-cylinder compression-ignition internal combustion engines. 4,294,210, Cl. 123-300.000.

Bassompierre-Sewrin, Christian C., to Martech International, Inc. Method for coating pipeline. 4,294,869, Cl. 427-177.000.

Bauer, Jerome: *See*—
Froehlig, Guy M., 4,294,782, Cl. 264-1.400.

Bauer, William A.: *See*—
Nystrom, William A.; Lanzel, Leo C.; and Bauer, William A., 4,294,438, Cl. 266-280.000.

Baumann, Dieter; and Bidegain, Pierre, to Bidegain S.A. Apparatus for determining the shoe size corresponding to a foot. 4,294,014, Cl. 33-3.00C.

Baumberger, Otto: *See*—
Kalbskopf, Reinhard; and Baumberger, Otto, 4,294,868, Cl. 427-109.000.

Baxter Travenol Laboratories, Inc.: *See*—
Bayham, Edward L., 4,294,574, Cl. 493-213.000.
Bilstad, Arnold C.; and Foley, John T., 4,294,320, Cl. 177-1.000.
Carter, Garry L.; Granzow, Daniel B.; and Bayham, Edward L., 4,294,247, Cl. 128-214.00D.
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Bayer Aktiengesellschaft: *See*—
Beck, Ulrich; and Rohloff, Ekhard, 4,294,656, Cl. 162-192.000.
Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, 4,294,777, Cl. 260-544.00D.
Cramm, Gunther; and Blocher, Karl H., 4,294,985, Cl. 564-18.000.
Grogler, Gerhard; Schwindt, Jurgen; Ganster, Otto; Meiners, Hans-Joachim; and Ruprecht, Hans-Dieter, 4,294,934, Cl. 521-160.000.
Hendricks, Udo-Winifred; Hildebrand, Dietrich; and Kuth, Robert, 4,294,579, Cl. 8-549.000.
Henk, Hermann; Wunderlich, Klaus; and Wild, Peter, 4,294,580, Cl. 8-549.000.
Hoffmann, Hellmut, 4,294,762, Cl. 260-340.300.
Klein, Alfons; Kron, Rudolf; Wedemeyer, Karlfried; Knust, Ernst; and Havenith, Lothar, 4,294,715, Cl. 361-318.000.
Krock, Friedrich W.; and Neeff, Rutger, 4,294,578, Cl. 8-516.000.
Krock, Friedrich W.; Neeff, Rutger; and Scheiter, Heinz, 4,294,769, Cl. 260-378.000.
Kuhlthau, Hans-Peter, 4,294,756, Cl. 260-163.000.
Preiss, Michael; and Metzger, Karl G., 4,294,827, Cl. 424-226.000.
Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,294,967, Cl. 546-242.000.
Schmidt, Robert R.; and Thomas, Rudolf, 4,294,607, Cl. 71-92.000.
Scholz, Karl-Heinz; Hartmann, Willy; and Heine, Hans-Georg, 4,294,973, Cl. 548-320.000.
Voss, Eckart; Petersen, Uwe; and Stadler, Peter, 4,294,959, Cl. 536-17.00R.
Wagner, Kuno; Block, Hans-Dieter; and Schafer, Walter, 4,294,719, Cl. 252-182.000.
Wilms, Klaus G.; and Waldmann, Helmut, 4,294,703, Cl. 210-631.000.

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Jochmann, Franz; and Jedeck, Helmar, 4,295,052, Cl. 307-10.00R.
Reh, Walter, 4,294,343, Cl. 192-113.00A.

Bayham, Edward L., to Baxter Travenol Laboratories, Inc. Method of making seal for flexible container. 4,294,574, Cl. 493-213.000.

Bayham, Edward L.: *See*—
Carter, Garry L.; Granzow, Daniel B.; and Bayham, Edward L., 4,294,247, Cl. 128-214.00D.

BBC Brown, Boveri & Company Limited: *See*—
Kaspar, Ernst, 4,295,071, Cl. 310-213.000.

Beatty, William E., Jr.; and Ellsworth, James P., to Westinghouse Electric Corp. Circuit breaker with electromechanical trip means. 4,295,025, Cl. 200-288.000.

Beauvais, Max P.; and Camezon, Raymond E. Method of apparatus for canning food products. 4,294,167, Cl. 99-369.000.

Bechle, Philip D.; and Roth, Joseph A., to Eastman Kodak Company. Instant processing sleeve. 4,294,906, Cl. 430-207.000.

Beck, Ulrich; and Rohloff, Ekhard, to Bayer Aktiengesellschaft. Process for measuring the state of charge of suspensions and for controlling the addition of auxiliary agents to the suspensions. 4,294,656, Cl. 162-192.000.

Beckman Instruments, Inc.: *See*—
Stephens, Donald E.; and Taylor, John T., 4,294,799, Cl. 422-62.000.

Beckman, John T., to Owens-Corning Fiberglas Corporation. Controlled multipackage winding. 4,294,416, Cl. 242-18.00G.

Bedue, Abel J. H.: *See*—
Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,294,311, Cl. 165-104.00S.

Beecham Group Limited: *See*—
Cassidy, Frederick; and Goudie, Alexander C., 4,294,972, Cl. 548-264.000.
Elliott, Thomas J.; and Ford, David, 4,294,823, Cl. 424-78.000.

Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, to Siemens Aktiengesellschaft. Device for coating objects. 4,294,194, Cl. 118-719.000.

Bell Telephone Laboratories, Incorporated: *See*—
Brunssen, James E., 4,295,188, Cl. 363-21.000.
Dombrowski, Leonard C., 4,295,226, Cl. 455-618.000.
Draper, Don R.; and Kusulas, Peter, Jr., 4,295,219, Cl. 371-51.000.
Wittwer, Norman C., 4,295,176, Cl. 361-91.000.

Bellas, Michael; and Cahill, Robert, to Eastman Kodak Company. Process for monoalkylation of dihydric phenols. 4,294,991, Cl. 568-650.000.

Bencene, Robert C.; and Granger, Charles A. Belt cleaning apparatus. 4,293,970, Cl. 15-21.00D.
Bendix Autolite Corporation: *See—*
Young, Ching T., 4,294,668, Cl. 204-1.00T.
Bendix Corporation, The: *See—*
Gage, Millard E.; and Landers, Derek J., 4,295,013, Cl. 200-11.00C.
O'Connor, James M.; and Goodrich, George W., 4,294,518, Cl. 350-357.000.
Bennett, Richard N., to National Instrument Company, Inc. Control system for filling machine. 4,294,294, Cl. 141-179.000.
Benson, Ernest J., to Better Agricultural Goals Corporation. Insulated container and process for shipping perishables. 4,294,079, Cl. 62-60.000.
Bentley Alemannia Limited: *See—*
Trautner, Johann G., 4,294,085, Cl. 66-75.100.
Bentley, John; and Thompson, Morice, to Imperial Chemical Industries Limited. Coating compositions. 4,294,735, Cl. 260-22.0CB.
Benzschawel, Steven J.: *See—*
Nauheimer, James F.; and Benzschawel, Steven J., 4,294,358, Cl. 206-419.000.
Beranger, Herve; Marzin, Claude; Omet, Dominique; and Peter, Jean-Luc, to International Business Machines Corporation. Power supply system for monolithic cells. 4,295,210, Cl. 365-227.000.
Berenov, Alexandr D.; Krainev, Vladislav P.; Mansurov, Midkhat M.; Niskovskikh, Vitaly M.; and Silin, Evgeny L. Withdrawal roll unit for horizontal continuous billet casting machines. 4,294,306, Cl. 164-448.000.
Berentzen, Hardo: *See—*
Mayer, Harald; and Berentzen, Hardo, 4,294,086, Cl. 66-121.000.
Beresniewicz, Aleksander, to Du Pont de Nemours, E. I., and Company. Water-extendible oligomer solutions and coatings therefrom. 4,294,738, Cl. 260-29.4UA.
Bergdahl, Knut. Arrangement to counteract or prevent spreading of fire or smoke. 4,294,165, Cl. 98-1.000.
Berger, Mitchell H.; Gill, Peter J.; and Maresca, Louis M., to Union Carbide Corporation. Process for preparing polyarylates in the presence of a diphenyl ether. 4,294,956, Cl. 528-179.000.
Berger, Mitchell H.; Maresca, Louis M.; and Matzner, Markus, to Union Carbide Corporation. Process for preparing polyarylates. 4,294,957, Cl. 528-179.000.
Berglind, Eilert: *See—*
Henoch, Bengt; and Berglind, Eilert, 4,295,221, Cl. 375-23.000.
Bergthaller, Peter: *See—*
Helling, Gunter; Saleck, Wilhelm; and Bergthaller, Peter, 4,294,920, Cl. 430-569.000.
Berkel, Michael R., to Owens-Illinois, Inc. Reshipper carton for finished or unfinished TV bulbs. 4,294,359, Cl. 206-422.000.
Bernard, Claude, to Agence Nationale de Valorisation de la Recherche (Anvar). Measuring head enabling the production of physiological measurement signals designed to be positioned on or in corporeal parts. 4,294,258, Cl. 128-635.000.
Bernard, Leo N., to Pervel Industries, Inc. Dyed flocked fabric and method of making the same. 4,294,577, Cl. 8-488.000.
Beroff, Howard: *See—*
Jewusiak, Stephen J.; Beroff, Howard; and Schuler, Michael, 4,294,355, Cl. 206-339.000.
Berr, Charles E.; and Deyrup, Edward J., to Du Pont de Nemours, E. I., and Company. Thermal stabilization of polyalkylene terephthalate resin compositions. 4,294,938, Cl. 525-101.000.
Berthier, Daniel, to Hewlett-Packard Company. Detector arrangement for data-card readers. 4,295,040, Cl. 235-458.000.
Bertholdo, Gene: *See—*
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Bertin & Cie: *See—*
Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., 4,294,232, Cl. 126-443.000.
Bertolacini, Ralph J.: *See—*
Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,294,685, Cl. 208-10.000.
Bertotti, Elvio: *See—*
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Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno, 4,294,748, Cl. 260-22.0CB.
Best Lock Corporation: *See—*
Best, Walter E.; and Foshee, William R., 4,294,089, Cl. 70-150.000.
Best, Walter E.; Foshee, William R.; and Flack, Max L., 4,294,093, Cl. 70-369.000.
Best, Walter E.; and Foshee, William R., to Best Lock Corporation. Latchbolt rim lock. 4,294,089, Cl. 70-150.000.
Best, Walter E.; Foshee, William R.; and Flack, Max L., to Best Lock Corporation. Pin tumbler lock with pull-resistant key plug. 4,294,093, Cl. 70-369.000.
Bettencourt, George S.: *See—*
Kovatch, George N.; Bettencourt, George S.; and Soles, Otto H., 4,295,054, Cl. 307-80.000.
Better Agricultural Goals Corporation: *See—*
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Betz Laboratories, Inc.: *See—*
Polizzotti, David M.; and Steelhammer, Joe C., 4,294,588, Cl. 55-5.000.
Bex, Peter T. J.; and Asselman, George A. A., to U.S. Philips Corporation. Drive for a machine comprising variable-stroke reciprocating pistons. 4,294,139, Cl. 74-839.000.
Bianchi, George. Harvester and method for harvesting green tomatoes. 4,294,063, Cl. 56-16.400.
Bidegain, Pierre: *See—*
Baumann, Dieter; and Bidegain, Pierre, 4,294,014, Cl. 33-3.00C.
Bidegain S.A.: *See—*
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Bigley, William J., Jr.; and Rizzo, Vincent J., to Lockheed Electronics Co., Inc. Load actuating servomechanism with resonance equalization. 4,295,081, Cl. 318-327.000.
Bilbrey, Donald L. Log cradle. 4,294,364, Cl. 211-60.00R.
Billenstein, Siegfried: *See—*
Kleber, Rolf; and Billenstein, Siegfried, 4,294,990, Cl. 568-601.000.
Billerud Uddeholm AB: *See—*
Kullander, Mats O., 4,294,872, Cl. 427-358.000.
Billot, Michel: *See—*
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Bills, David: *See—*
Yonker, John H.; Fisher, Ernest P., Jr.; and Bills, David, 4,294,315, Cl. 166-322.000.
Bilstad, Arnold C.; and Foley, John T., to Baxter Travenol Laboratories, Inc. Method and apparatus for weighing material being collected. 4,294,320, Cl. 177-1.000.
Binder, Georg; and Wossner, Gunter, to Robert Bosch GmbH. Cooling apparatus for electrical machinery. 4,295,067, Cl. 310-52.000.
Binder, Klaus: *See—*
Eisele, Erwin; Charzinski, Hans-Peter; and Binder, Klaus, 4,294,209, Cl. 123-293.000.
Bindin, Peter J., to Chloride Silent Power Limited. Sealing of ceramic electrolyte tubes in electrochemical cells. 4,294,897, Cl. 429-104.000.
Bingham, John A. C., to Racal-Vadic, Inc. Switched-capacitor modulator. 4,295,105, Cl. 332-9.00R.
Bings, Hubert: *See—*
Kruger, Jorg; Thome, Roland; Moritz, Dieter; Bings, Hubert; and Losert, Herbert, 4,294,816, Cl. 423-484.000.
Bio-Rad Laboratories, Inc.: *See—*
Curry, Robert E.; and Simonsen, Michael G., 4,295,199, Cl. 364-555.000.
Biondetti, Mario, to Escher Wyss Limited. Controlled deflection roll. 4,293,988, Cl. 29-116.0AD.
Bios Inc.: *See—*
Picunko, Thomas; Kramer, Henry H.; Dam, Naim G.; and Gray, Robert I., 4,294,259, Cl. 128-653.000.
Biospherics Incorporated: *See—*
Levin, Gilbert V.; and Straat, Patricia A., 4,294,931, Cl. 435-301.000.
Bissell, Eugene R.: *See—*
Smith, Robert E.; and Bissell, Eugene R., 4,294,923, Cl. 435-23.000.
Bjorklund, Anders; Persson, Erik; and Virsberg, Lars-Goran, to Asea Aktiebolag. Sheet-wound transformer or reactor. 4,295,113, Cl. 336-84.00M.
Black, John W., to Pemco-Kalamazoo, Inc. Metal disk wheel with resilient tread and bearing support. 4,294,491, Cl. 301-63.0DD.
Black, John W.: *See—*
Peters, Lester L.; and Black, John W., 4,294,109, Cl. 73-119.00A.
Blackburn, Martin J.; and Smith, Michael P., to United Technologies Corporation. Titanium alloys of the TiAl type. 4,294,615, Cl. 75-175.500.
Blair, Eskel B.; and Koleske, Joseph V., to Union Carbide Corporation. Stabilizers for cycloaliphatic epoxide containing compositions. 4,294,746, Cl. 260-37.0EP.
Blair, Matthew J.; and Wiktorowski, Thomas A., to Republic Steel Corporation. Method and apparatus for cooling BOF hood paneling. 4,294,432, Cl. 266-46.000.
Blake, William W., to Caterpillar Tractor Co. Pressure modulating valve. 4,294,278, Cl. 137-115.000.
Blanchard, Carroll H.; and Marcelonis, Robert P. Shield for typewriter keyboard and cylinder. 4,294,557, Cl. 400-714.000.
Blau KG Fabrik Fur Kraftfahrzeugteile: *See—*
Gerdes, Thedor, 4,294,375, Cl. 220-293.000.
Gerdes, Theodor, 4,294,281, Cl. 137-541.000.
Blauer, Aaron. Prefabricated load bearing structure. 4,294,052, Cl. 52-236.500.
Blocher, Karl H.: *See—*
Cramm, Gunther; and Blocher, Karl H., 4,294,985, Cl. 564-18.000.
Block, Hans-Dieter: *See—*
Wagner, Kuno; Block, Hans-Dieter; and Schafer, Walter, 4,294,719, Cl. 252-182.000.
Block, Thomas S., to Clarke-Gravely Corporation. Flour treating machine with squeegee. 4,293,971, Cl. 15-98.000.
Bloomfield Farms, Inc.: *See—*
Olin, C. Howard, 4,294,295, Cl. 144-3.00K.
Blueberry Equipment, Inc.: *See—*
Patzlaff, Albert W., 4,294,691, Cl. 209-3.100.
Bluhm, Leslie: *See—*
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Blum, Arnold; Geng, Hellmuth R.; Schulze-Schoelling, Hermann; and Spaeth, Bernd, to International Business Machines Corporation. Clock check circuits using delayed signals. 4,295,220, Cl. 371-61.000.
Board of Reagents, University of Texas: *See—*
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Boaz, Premakaran T., to Ford Motor Company. Method for developing a pattern on a ceramic substrate. 4,294,867, Cl. 427-96.000.

Bock, Erich: *See—*
Rauschert, Willi; Rieger, Gerald; Bock, Erich; and Eckel, Alfred, 4,294,172, Cl. 102-473.000.

Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, to Bayer Aktiengesellschaft. Color-stabilized aromatic carboxylic acid chlorides and a process for their preparation. 4,294,777, Cl. 260-544.00D.

Bodenbender, Manfred; Reinhardt, Willy; and Ritzenhoff, Hermann, to Hermann Ritzenhoff, Firma. Metal sealing cap. 4,294,368, Cl. 215-256.000.

Bodenseewerk Geratetechnik GmbH: *See—*
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Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, 4,294,126, Cl. 73-864.210.
Tomoff, Toma, 4,294,127, Cl. 73-864.210.

Bodewein, Jakob, to Jagenberg Werke AG. Machine for the crosscutting of a web conveyed as a multi-ply web. 4,294,145, Cl. 83-302.000.

Boehringer, Wilfred E., to McDonnell Douglas Corporation. Non adjustable hydraulic cylinder. 4,294,163, Cl. 92-52.000.

Boeing Company, The: *See—*
Horne, William E., 4,294,602, Cl. 65-40.000.
Hyatt, Michael V.; and Quist, William E., 4,294,625, Cl. 148-2.000.
Klees, Garry W., 4,294,068, Cl. 60-204.000.

Boese, Harold L., to Cryogenics Unlimited. Cryogenic powered vehicle. 4,294,323, Cl. 180-54.00B.

Boettcher, John W.: *See—*
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Bofors America, Inc.: *See—*
Studlien, Vance D., 4,295,116, Cl. 338-4.000.

Bogner, Richard D. Disc-on-rod end-fire microwave antenna. 4,295,141, Cl. 343-753.000.

Bohlin, Karl G.; Fredriksson, Borje I.; Karlsson, Kent A. B.; and Nelvig, Lars T., to SCA Development Aktiebolag. Method and apparatus for controlling wood pulp grinding machines. 4,294,412, Cl. 241-30.000.

Bolesky, Richard C.: *See—*
Gold, Barry L.; and Bolesky, Richard C., 4,293,963, Cl. 3-1.910.

Boliden Aktiebolag: *See—*
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Bollinger, Roger K.: *See—*
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Bonifer, Georg W.: *See—*
Killmann, Irolt; and Bonifer, Georg W., 4,294,546, Cl. 356-399.000.

Bonori, Maurizio; and Franconi, Cañero, to AD.ELE. -Advanced Electronics- S.R.L. Low consumption pulses doppler effect intrusion sensor. 4,295,131, Cl. 340-554.000.

Boone, Gary A., to Carmet Company. Eight edge positive chip control insert. 4,294,566, Cl. 407-114.000.

Borg-Warner Corporation: *See—*
Simmons, John P., 4,294,338, Cl. 192-4.00A.

Borio, Richard W.; and Mehta, Arun K., to Combustion Engineering, Inc. Tangential firing system. 4,294,178, Cl. 110-347.000.

Boris, Robert W.: *See—*
Oram, W. Wayne; Oram, Nora L.; and Boris, Robert W., 4,294,239, Cl. 128-96.000.

Borja, Jesus; and Halvorsen, Jack R., to Illinois Tool Works Inc. Threaded screw mounting means. 4,295,003, Cl. 174-53.000.

Borowski, Edward: *See—*
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

Borrelli, Dominick. Electrical housing and switch box. 4,295,018, Cl. 200-51.090.

Borsig GmbH: *See—*
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Borzym, John J. Tube cutting apparatus. 4,294,147, Cl. 83-382.000.

Bosch-Siemens Hausgerate GmbH: *See—*
Reichl, Ernst; and Marloth, Herbert, 4,294,407, Cl. 239-102.000.

Bosso, Joseph F., to PPG Industries, Inc. Cationic polymers and their use in electrodeposition. 4,294,741, Cl. 260-29.6NR.

Boswell, William C. Shifting valve. 4,294,287, Cl. 137-625.690.

Bottcher, Winfried; and Germer, Kurt, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Device for applying thread staples to folded sheets. 4,294,182, Cl. 112-21.000.

Boutin, Jean; Guenot, Bernard; and Jamet, Bruno, to Rhone-Poulenc Industries. Aqueous monomer solutions adapted for direct photopolymerization. 4,294,676, Cl. 204-159.230.

Bouwman, Johannes E., to Nedschroef Octrooi Maatschappij N.V. Self-locking fastener. 4,294,300, Cl. 411-185.000.

Bouyoucos, John V.: *See—*
Nelson, David E.; and Bouyoucos, John V., 4,294,513, Cl. 350-96.290.

Bowerman, Leonard E., to Electrolux Corporation. Vacuum cleaner including automatic shutoff device. 4,294,595, Cl. 55-213.000.

Bowman, John A.: *See—*
Dulaney, Donald C.; and Bowman, John A., 4,294,619, Cl. 106-188.000.

Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., to Bertin & Cie. Solar collector. 4,294,232, Cl. 126-443.000.

Boyesen, Eyvind, to Performance Industries, Inc. Fuel porting for two cycle internal combustion engine. 4,294,202, Cl. 123-73.0PP.

Boys, John T., to University of Auckland, The. Apparatus and method for generating waveforms which are particularly suitable for a PWM-driven motor. 4,295,189, Cl. 363-41.000.

Bozon, Alfred; Koberstein, Edgar; Pletka, Hans-Dieter; Volker, Herbert; and Lakatos, Eduard, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Catalyst for the purification of exhaust gases of internal combustion engines. 4,294,726, Cl. 252-462.000.

Bozzuto, Carl R.: *See—*
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Brandenstein, Manfred: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schulz, Toni, 4,294,100, Cl. 72-340.000.

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Bratt, Martin D.; and Oakley, John F., to Du Pont de Nemours, E. I., and Company. Apparatus for pre-conditioning film. 4,294,533, Cl. 354-318.000.

Braun, Charles H.: *See—*
Peffer, Robert M.; and Braun, Charles H., 4,294,104, Cl. 73-9.000.

Brede, Uwe; and Kern, Heinz, to Dynamit Nobel Aktiengesellschaft. Method for increasing the resistance of igniter elements of given geometry. 4,294,648, Cl. 156-627.000.

Bremer, Noel J.; and Dria, Dennis E., to Standard Oil Company. Preparation of vanadium phosphorus catalysts. 4,294,722, Cl. 252-435.000.

Brems, John J.: *See—*
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Brendle, Paul C.: *See—*
Lloyd, C. F.; Zalewski, Z. Leo; and Brendle, Paul C., 4,295,066, Cl. 310-30.000.

Breneman, Jack L., to Quaker Oats Company, The. Toy simulated rocket propelled aircraft system. 4,294,032, Cl. 46-1.00R.

Brennan, Michael P. J., to Chloride Silent Power Limited. Method of forming cathodic electrode structure for a sodium sulfur cell. 4,294,005, Cl. 29-623.500.

Brennan, Ray A. Air flotation ore enriching apparatus. 4,294,693, Cl. 209-466.000.

Bridgestone Tire Company Limited: *See—*
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Ohyachi, Tomio; and Irako, Koichi, 4,294,732, Cl. 260-27.0BB.

Bristol-Myers Company: *See—*
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British Cellophane Limited: *See—*
Andrews, William J.; Espley, David J. C.; and Philpott, William J. M., 4,294,882, Cl. 428-349.000.

British Gas Corporation: *See—*
Thomas, Richard C.; Pegler, Stewart M.; and Cordes, Paul B., 4,295,095, Cl. 324-326.000.

Britton, Kenneth L., to Inspiration Consolidated Copper Company. Electrode seal. 4,295,001, Cl. 13-17.000.

Brockman, Milton H.: *See—*
United States of America, National Aeronautics and Space Administration; and Brockman, Milton H., 4,295,140, Cl. 343-100.0PE.

Bronnec, Jean A. L., to Etablissements Generaux de Mecanique de l'Ouest. Device for cleaning liquid surfaces. 4,294,698, Cl. 210-242.300.

Bronstein-Bonte, Irena Y.; Lindholm, Edward P.; and Taylor, Lloyd D., to Polaroid Corporation. Image-receiving elements. 4,294,907, Cl. 430-213.000.

Brooks, Albert C. Portable hoist frame. 4,294,176, Cl. 105-363.000.

Brooks, Philip A. Moving picture apparatus. 4,294,516, Cl. 350-335.000.

Broquet, Jean B., to Matra. Attitude control systems for space vehicles. 4,294,420, Cl. 244-165.000.

Brown, William F., to Weston Research Corporation. Dry wall joint and finishing compounds. 4,294,622, Cl. 106-314.000.

Bruhne, Friedrich: *See—*
Bockmann, Walter; Lipper, Karl-August; and Bruhne, Friedrich, 4,294,777, Cl. 260-544.00D.

Brundage, Ruth P.: *See—*
Lesher, George Y.; and Brundage, Ruth P., 4,294,836, Cl. 424-263.000.

Bruns, Klaus: *See—*
Conrad, Jens; Upadek, Horst; and Bruns, Klaus, 4,294,727, Cl. 252-522.00R.

Brunssen, James E., to Bell Telephone Laboratories, Incorporated. Converter circuit providing isolation and load sensing. 4,295,188, Cl. 363-21.000.

Bryant, LeRoy J. Device for retaining a compound bow in a partially drawn condition. 4,294,221, Cl. 124-23.00R.

Buchmuller, Horst; and Michelbrink, Bernhard, to Deutsche Babcock Aktiengesellschaft. Apparatus for the hydraulic transport of precipitator dust. 4,294,592, Cl. 55-120.000.

Buckeye Cellulose Corporation, The: *See—*
Camden, James B.; and Vinson, Kenneth D., 4,294,876, Cl. 428-95.000.

Buckshaw, Thomas M., to Robertshaw Controls Company. Water level control device and method of making the same. 4,295,019, Cl. 200-61.200.

Bud Antle, Inc.: *See*—
Cayton, David W.; Armstrong, Errol C.; and MacKenzie, Angus B., 4,294,179, Cl. 111-3.000.

Bullis, Stephen J.: *See*—
Patenaude, Raymond A.; Cozzy, Thomas W.; and Bullis, Stephen J., 4,294,158, Cl. 89-12.000.

Bulten-Kanthal Aktiebolag: *See*—
Lindgren, Hakan O.; and Magnusson, Bengt, 4,295,033, Cl. 219-388.000.

Burgess, William H., III; and Heiberger, Philip, to Du Pont de Nemours, E. I., and Company. Accelerated process for making nonlinear polyesters. 4,294,736, Cl. 260-22.00M.

Burgett, Michael W.; and Harte, Richard A., to International Diagnostic Technology, Inc. Method of fluoro immunoassay. 4,294,817, Cl. 424-8.000.

Burney, Charles F.; and Laymon, Marvin D., to GTE Products Corporation. Capacitance intrusion detection system. 4,295,132, Cl. 340-562.000.

Burnham, Ralph L., to United States of America, Navy. Laser having simultaneous ultraviolet and visible wavelengths. 4,295,104, Cl. 331-94.50C.

Burns, Lyle D., to Phillips Petroleum Company. Motor fuel. 4,294,587, Cl. 44-74.000.

Burns, William S., Jr.; and Sankey, William M., to Western Electric Company, Incorporated. Safety guards and methods for manually feeding workpieces to assembly machines. 4,294,480, Cl. 294-131.000.

Buro Patent A.G.: *See*—
Todt, Gerhard H., 4,294,174, Cl. 104-250.000.

Burroughs Wellcome Co.: *See*—
Schaeffer, Howard J., 4,294,831, Cl. 424-253.000.
Weston, John B., 4,294,842, Cl. 424-272.000.
Weston, John B., 4,294,843, Cl. 424-272.000.

Burton, Edward D., to Great Lakes Carbon Corporation. Foundry coke. 4,294,610, Cl. 75-43.000.

Buser, Hansueli; and Jordi, Peter E., to Ciba-Geigy Corporation. Sample charger for a gas chromatograph. 4,294,117, Cl. 73-864.850.

Bussey, Joseph G., to Stimtech, Inc. Perioperative application of electronic pain control in combination with anesthetic agents. 4,294,245, Cl. 128-207.210.

BXL Plastics Limited: *See*—
Jack, James; and Gray, Derek C., 4,294,796, Cl. 264-559.000.

Byrnes, Bruce R.: *See*—
Byrnes, Robert J.; and Byrnes, Bruce R., 4,294,017, Cl. 33-265.000.

Byrnes, Robert J.; and Byrnes, Bruce R. Archery sighting device and methods of constructing and utilizing same. 4,294,017, Cl. 33-265.000.

Bystrov, Valentin P.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Cade, Phillip J., to Electronics Corporation of America. System condition indicator. 4,295,129, Cl. 340-520.000.

Cahill, Robert: *See*—
Bellas, Michael; and Cahill, Robert, 4,294,991, Cl. 568-650.000.

Cain, John D.; and Lovie, Gary C., to NCR Canada Ltd.-NCR Canada Ltee. Document sorting method. 4,295,206, Cl. 364-900.000.

Calmac Manufacturing Corporation: *See*—
MacCracken, Calvin D., 4,294,078, Cl. 62-59.000.

Camardella, Giuseppe, to Tekma Kinomat S.p.A. Static wire tensioner for coil winding machines. 4,294,417, Cl. 242-149.000.

Camden, James B.; and Vinson, Kenneth D., to Buckeye Cellulose Corporation, The. Tufted material having a laminated film primary tufting substrate. 4,294,876, Cl. 428-95.000.

Camezon, Raymond E.: *See*—
Beauvais, Max P.; and Camezon, Raymond E., 4,294,167, Cl. 99-369.000.

Camp, Vann T., to United Technologies Corporation. Exhaust nozzle control and core engine fuel control for turbofan engine. 4,294,069, Cl. 60-238.000.

Campbell, Charles S., to United Kingdom Atomic Energy Authority. Apparatus for use in a liquid alkali metal environment. 4,294,659, Cl. 165-133.000.

Campbell, Gerald A.: *See*—
Upson, Donald A.; Campbell, Gerald A.; and Kestner, Diane E., 4,294,739, Cl. 260-29.6RW.

Cannings, John A. Rotary seal unit. 4,294,454, Cl. 277-65.000.

Canon Kabushiki Kaisha: *See*—
Ban, Mikichi, 4,294,538, Cl. 355-51.000.
Ito, Susumu; Sugawara, Noboru; and Amano, Sayoko, 4,294,890, Cl. 428-641.000.
Iwashita, Tomonori; Fukahori, Hidehiko; and Mashimo, Yukio, 4,294,530, Cl. 354-173.000.
Sato, Yasuhisa; Tsuji, Sadahiko; and Ishikawa, Kazuo, 4,294,529, Cl. 354-53.000.
Sugiura, Muneharu; and Sagara, Seiji, 4,295,186, Cl. 362-217.000.

Cantlin, John H., to Hudson Lock, Inc. Garage door lock. 4,295,016, Cl. 200-44.000.

Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., to Olin Corporation. Sodium amalgam monitor. 4,294,798, Cl. 422-62.000.

Carl Hahn, G.m.b.H.: *See*—
Friese, Axel, 4,294,253, Cl. 128-285.000.

Carlsen, W. John, to GTE Laboratories Incorporated. Reading one-dimensional line image holograms of a video from a disc with a guide track. 4,295,162, Cl. 358-128.600.

Carmet Company: *See*—
Boone, Gary A., 4,294,566, Cl. 407-114.000.

Carollo, Jerome T.; and Barbarasch, Joseph, to General Electric Company. Light projection system. 4,295,159, Cl. 358-22.000.

Carrier Corporation: *See*—
Geary, Carl H., Jr., 4,293,996, Cl. 29-446.000.

Carson, John R., to McNeilab, Inc. Preparation of 5-(arylcyanohydroxymethyl)-1-loweralkylpyrrole-2-acetic acid derivatives. 4,294,760, Cl. 260-326.470.

Carter, Don R.; Doner, Claude E.; Hammersand, Fred G.; and Tomcavage, Joseph R., to RCA Corporation. Circumferentially apertured cylindrical grid for electron tube. 4,295,077, Cl. 313-293.000.

Carter, Garry L.; Granzow, Daniel B.; and Bayham, Edward L., to Baxter Travenol Laboratories, Inc. Frangible, resealable closure for a flexible tube. 4,294,247, Cl. 128-214.00D.

Carter, Morris G.: *See*—
Ammons, Staron E.; Paschall, Edwin L.; and Carter, Morris G., 4,294,403, Cl. 236-13.000.

Casio Computer Co., Ltd.: *See*—
Fujisawa, Hidetaka, 4,294,154, Cl. 84-1.010.

Casper, Thomas J., to Envirex Inc. Submerged large diameter seal. 4,294,700, Cl. 210-403.000.

Cassand, Jean: *See*—
Cholet, Jacques; Magneville, Pierre; and Cassand, Jean, 4,294,328, Cl. 181-120.000.

Cassidy, Frederick; and Goudie, Alexander C., to Beecham Group Limited. 1,2-Disubstituted oxo triazolidine. 4,294,972, Cl. 548-264.000.

Cassill, William G.: *See*—
Rutledge, Wyman C.; Graves, J. Robert; and Cassill, William G., 4,294,111, Cl. 73-150.00R.

Castaneda, Fernando: *See*—
Stockli, Andre; Castaneda, Fernando; and Stockli, Jean-Louis, 4,294,022, Cl. 36-4.000.

Castelli, Enrico: *See*—
Eschinasi, Emile H.; and Castelli, Enrico, 4,294,767, Cl. 260-347.800.

Caterpillar Tractor Co.: *See*—
Blake, William W., 4,294,278, Cl. 137-115.000.
Flesburg, Edward E., 4,294,303, Cl. 164-44.000.
King, Dennis M.; and Richardson, Ronald D., 4,294,218, Cl. 123-502.000.
Simmons, Gerald P., 4,294,465, Cl. 280-756.000.

Caux, Gerard: *See*—
Couderc, Pierre; Grardel, Jean-Luc; and Caux, Gerard, 4,294,717, Cl. 252-97.000.

Cayton, David W.; Armstrong, Errol C.; and MacKenzie, Angus B., to Bud Antle, Inc. Dibble tube soil plug planter. 4,294,179, Cl. 111-3.000.

Cazier, Verl O.: *See*—
Anderson, Kenneth W.; Summerhays, Brent; and Cazier, Verl O., 4,295,044, Cl. 250-229.000.

CBS Inc.: *See*—
Turner, James, 4,294,155, Cl. 84-1.010.

Cecchin, Giuliano; and Albizzati, Enrico, to Montedison S.p.A. Process for preparing components of catalysts for polymerizing alpha-olefins and mixtures thereof with ethylene. 4,294,721, Cl. 252-429.00B.

CEM - Compagnie Electro-Mecanique: *See*—
Delassus, Jean, 4,294,304, Cl. 164-504.000.

Centro Ricerche Fiat S.p.A.: *See*—
Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, 4,294,210, Cl. 123-300.000.
Iemmi, Giuliano; and Macerata, Diego, 4,294,893, Cl. 429-42.000.
Taricco, Stefano, 4,294,609, Cl. 75-34.000.

Cerroni, Manlio. Apparatus for the breaking of heterogeneous materials, as city solid wastes. 4,294,413, Cl. 241-36.000.

Chakrabarti, Paritosh M.: *See*—
Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., 4,294,848, Cl. 424-302.000.

Chamness, Dale L. Surgical apparatus. 4,294,254, Cl. 128-303.140.

Champion International Corporation: *See*—
Fogle, Ozzie, 4,294,187, Cl. 118-244.000.
Schlotter, Harold J.; and Young, Leroy, 4,294,452, Cl. 273-403.000.

Champseix, Alain A.; and Le Fur, Gerard R., to Pharmindustrie. Derivatives of 1-phenyl 3-(4-piperidyl) 1-propanone usable as drugs. 4,294,841, Cl. 424-267.000.

Chang, Chi S.: *See*—
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.

Chang, Long F., to Owens-Illinois, Inc. Free-standing plastic bottle. 4,294,366, Cl. 215-1.00C.

Chang, Richard R.; Frantz, Gene A.; and Hawkins, William R., to Texas Instruments Incorporated. Module for an integrated circuit system. 4,295,181, Cl. 361-395.000.

Chapman, Arthur J.; and Hayes, Geoffrey M. G., to Pentabloc, Ltd. Jointing member for frame systems. 4,294,561, Cl. 403-219.000.

Chappell, Terry I., to International Business Machines Corporation. Semiconductor fiber optical detection. 4,294,510, Cl. 350-96.170.

Chappell, Terry I.; and Woodall, Jerry M., to International Business Machines Corporation. Heterojunction V-groove multijunction solar cell. 4,295,002, Cl. 136-244.000.
Charzinski, Hans-Peter: *See—*
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Cheetham, Jeffery J. Containers. 4,294,351, Cl. 206-222.000.
Chehovah, Felix, to Thomson-CSF. Series-parallel print mechanism for printer. 4,294,551, Cl. 400-119.000.
Chemische Werke Huls Aktiengesellschaft: *See—*
Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, 4,294,947, Cl. 526-119.000.
Chen, Evan N.; and Ferraro, Frank A., to Warner-Lambert Company. Rotatable safety razor and blade cartridge therefor. 4,294,010, Cl. 30-42.000.
Chen, Shin-I. Constant pressure cooker and fastener. 4,294,377, Cl. 220-321.000.
Cheng, Paul J., to Phillips Petroleum Company. Carbon black process and reactor. 4,294,814, Cl. 423-457.000.
Chesler, Ronald B.: *See—*
Dabby, Franklin W.; and Chesler, Ronald B., 4,294,601, Cl. 65-3.120.
Chesworth, Graham: *See—*
Seed, Geoffrey; Chesworth, Graham; Hind, John R.; and Hodgson, Donald, 4,294,661, Cl. 376-363.000.
Chevalier, Philippe J. M. R.: *See—*
Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., 4,294,232, Cl. 126-443.000.
Chevron Research Company: *See—*
Feffer, Philip C., 4,293,985, Cl. 28-254.000.
Lewis, Robert A.; and Honnen, Lewis R., 4,294,714, Cl. 252-34.000.
Chiba, Toshiyuki: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,294,960, Cl. 544-22.000.
Chidsey, Francis A., Jr., to Container Corporation of America. Partition for carrier carton. 4,294,398, Cl. 229-15.000.
Chimura, Kozo: *See—*
Kitai, Kiyoshi; Ogihara, Masuo; and Chimura, Kozo, 4,295,215, Cl. 368-196.000.
Chloride Silent Power Limited: *See—*
Bindin, Peter J., 4,294,897, Cl. 429-104.000.
Brennan, Michael P. J., 4,294,005, Cl. 29-623.500.
Chlorine Engineers Corp., Ltd.: *See—*
Kasuya, Kazuki, 4,294,628, Cl. 148-6.350.
Chlosta, Wolfgang: *See—*
Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, 4,294,126, Cl. 73-864.210.
Chmela, Franz: *See—*
Urlaub, Alfred; and Chmela, Franz, 4,294,206, Cl. 123-276.000.
Cholet, Jacques; Magneville, Pierre; and Cassand, Jean, to Institut Francais du Petrole. Device for emitting acoustic waves in a liquid medium by implosion. 4,294,328, Cl. 181-120.000.
Chr. Eisele Maschinenfabrik GmbH. & Co. KG: *See—*
Drixler, Karl, 4,294,148, Cl. 83-397.000.
Christiansen, David W., to Babcock & Wilcox Company, The. Spacer assembly retainer arrangement. 4,294,660, Cl. 376-442.000.
Chubb Integrated Systems Limited: *See—*
Rankin, Kenneth F., 4,294,380, Cl. 221-195.000.
Ciba-Geigy AG: *See—*
Postle, Stephen R.; and Psaila, Alexander, 4,294,916, Cl. 430-522.000.
Postle, Stephen R.; and Psaila, Alexander, 4,294,917, Cl. 430-522.000.
Ciba-Geigy Corporation: *See—*
Adam, Jean-Marie, 4,294,768, Cl. 260-372.000.
Buser, Hansueli; and Jordi, Peter E., 4,294,117, Cl. 73-864.850.
Hubele, Adolf, 4,294,850, Cl. 424-309.000.
Karrer, Friedrich, 4,294,949, Cl. 526-262.000.
Kreibich, Ursula; and Schmid, Rolf, 4,294,227, Cl. 126-400.000.
Martin, Henry, 4,294,772, Cl. 260-429.700.
Rody, Jean, 4,294,963, Cl. 544-198.000.
Schmid, Rolf; and Lohse, Friedrich, 4,294,745, Cl. 260-37.0EP.
Tobler, Hans; Fory, Werner; and Schurter, Rolf, 4,294,606, Cl. 71-88.000.
Zergenyi, Janos, 4,294,966, Cl. 544-316.000.
Cilny, Eugene J. Mono-seat gate valve. 4,294,427, Cl. 251-86.000.
Clarion Co., Ltd.: *See—*
Ariga, Shoji, 4,294,354, Cl. 206-335.000.
Clark, Merlin W. Aerial amusement projectile and method of manufacture. 4,294,447, Cl. 273-58.00R.
Clarke-Gravely Corporation: *See—*
Block, Thomas S., 4,293,971, Cl. 15-98.000.
Clay, Robert B. Blasting composition. 4,294,633, Cl. 149-2.000.
Cleland, Marshall R.; and Malone, Howard F., Sr. Method and system for scanning a beam of charged particles to control irradiation dosage. 4,295,048, Cl. 250-398.000.
Clelford, Douglas H.: *See—*
Fowler, Donald W.; and Clelford, Douglas H., 4,294,162, Cl. 91-434.000.
Clemence, Francois: *See—*
Humbert, Daniel; Clemence, Francois; and Dagnaux, Michele, 4,294,845, Cl. 424-278.00Q.
Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,294,631, Cl. 148-133.000.
Closs, Joseph J. Single stage rankine and cycle power plant. 4,294,075, Cl. 60-671.000.
Cochran, Loretta. Hair treating fluid applicator. 4,294,270, Cl. 132-112.000.
Cogit Systems, Inc.: *See—*
Copeland, Robert K.; and Dimaggio, Richard J., 4,295,198, Cl. 364-515.000.
Cohen, Georges; and Rojey, Alexandre, to Institut Francais du Petrole. Desorption step in absorption heat pumps and refrigerators. 4,294,080, Cl. 62-101.000.
Colgate-Palmolive Company: *See—*
Kaeser, James A., 4,294,718, Cl. 252-135.000.
Colloff, Nicholas J., to Lucas Industries Limited. Method of joining a pair of metal parts. 4,294,392, Cl. 228-111.000.
Colosimo, Ernest: *See—*
Colosimo, Gabriel A.; and Colosimo, Ernest, 4,293,979, Cl. 17-32.000.
Colosimo, Gabriel A.; and Colosimo, Ernest. Forming press for sausage and the like. 4,293,979, Cl. 17-32.000.
Colt Industries Operating Corp: *See—*
McCabe, Ralph P.; and Marsh, Keith D., 4,294,282, Cl. 137-595.000.
Combs, Steven P.: *See—*
Greenwald, A. Seth; Geiger, Jack M.; Narten, Nathaniel C.; Porritt, Derek S.; Combs, Steven P.; and Brems, John J., 4,294,251, Cl. 128-276.000.
Combustion Engineering, Inc.: *See—*
Borio, Richard W.; and Mehta, Arun K., 4,294,178, Cl. 110-347.000.
Darling, Scott L.; and Bozzuto, Carl R., 4,294,199, Cl. 122-276.000.
Command Control & Communications Corporation: *See—*
Apple, Joseph; and Upton, Eric L., 4,294,543, Cl. 356-375.000.
Commeau, Alain: *See—*
Guignard, Paul; and Commeau, Alain, 4,294,662, Cl. 219-61.000.
Commissariat a l'Energie Atomique: *See—*
Marine, Jean; and Ravetto, Michel, 4,295,148, Cl. 357-17.000.
Compagnie Francaise d'Etudes et de Construction Technip: *See—*
Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, 4,294,311, Cl. 165-104.00S.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Gevaud, Roland; and Tallon, Jacques, 4,294,106, Cl. 73-40.700.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
Ugon, Michel, 4,295,041, Cl. 234-487.000.
Congoleum Corporation: *See—*
Graham, Alan A.; Haemer, Laurence F.; and Miller, Charles H., 4,294,786, Cl. 264-46.400.
Conoco, Inc.: *See—*
Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., 4,295,096, Cl. 324-357.000.
Conrad, Jens; Upadek, Horst; and Bruns, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Perfume composition containing 4,5-dioxa-5-alkyl-tricyclo[7.2.1.0 ^{2,8}]dodec-10-enes and its use as an odorant. 4,294,727, Cl. 252-522.00R.
Consolidated Fiberglass Products Company: *See—*
Pfeffer, John R., 4,294,655, Cl. 162-107.000.
Constantine, Albert B.: *See—*
Thompson, Raymond V.; Todd, Alan; and Constantine, Albert B., 4,294,549, Cl. 366-164.000.
Container Corporation of America: *See—*
Chidsey, Francis A., Jr., 4,294,398, Cl. 229-15.000.
Kohler, Karl A., 4,294,397, Cl. 229-27.000.
Nauheimer, James F.; and Benzschawel, Steven J., 4,294,358, Cl. 206-419.000.
Cooperman, Michael, to GTE Laboratories Incorporated. Methods of and apparatus for generating reference voltages. 4,295,089, Cl. 323-351.000.
Copeland, Robert K.; and Dimaggio, Richard J., to Cogit Systems, Inc. Automatic printed circuit dimensioning, routing and inspecting apparatus. 4,295,198, Cl. 364-515.000.
Copelin, Harry B., to Du Pont de Nemours, E. I., and Company. Preparation of high purity 1,4-butanediol. 4,294,998, Cl. 568-868.000.
Cordes, Paul B.: *See—*
Thomas, Richard C.; Pegler, Stewart M.; and Cordes, Paul B., 4,295,095, Cl. 324-326.000.
Cordes, Werner, to Aristo Graphic Systeme GmbH & Co. KG. Device for moving automatic drawing machine tools. 4,295,146, Cl. 346-140.00R.
Cordray, Daniel E., to General Electric Company. Pilot wire relay protection system for electrical distribution networks. 4,295,175, Cl. 361-69.000.
Cornetti, Giorgio: *See—*
Bassoli, Cesare; Cornetti, Giorgio; and Lovisolo, Francesco, 4,294,210, Cl. 123-300.000.
Corning Glass Works: *See—*
Ohls, James W., 4,294,190, Cl. 118-620.000.
Coroncos, James H. Process for preparing beef for use on a vertical rotisserie. 4,294,865, Cl. 426-646.000.
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno. Low viscosity unsaturated polyester resins. 4,294,734, Cl. 260-22.0CB.
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno. Low viscosity unsaturated polyester resins. 4,294,748, Cl. 260-22.0CB.
Couchman, James C., to General Dynamics Corporation. Fastener incorporating ultrasonic transducer. 4,294,122, Cl. 73-761.000.
Couderc, Pierre; Grardel, Jean-Luc; and Caux, Gerard, to Societe Chimique des Charbonnages SA. Compositions containing an alkali metal mono- or polyalkylarylsulfonate and the corresponding hydro-

peroxide, process for their preparation and detergent compositions containing them. 4,294,717, Cl. 252-97.000.

Coulter Systems Corporation: *See—*
Kuehnle, Manfred R., 4,294,678, Cl. 204-192.00R.

Coulthard, John L. Anaerobic filter. 4,294,694, Cl. 210-150.000.

Coverstone, Don A., to Lyall Electric, Inc. Insulated radiant heating panel. 4,294,003, Cl. 29-611.000.

Cowan, Keith B.: *See—*
Winegard, John R.; Shelledy, Carey W.; and Cowan, Keith B., 4,295,143, Cl. 343-840.000.

Cowans, Kenneth W., to Kinergetics, Inc. Survival system. 4,294,242, Cl. 128-201.130.

Cox, Charles P., Jr. Gasoline and diesel fuel additive. 4,294,586, Cl. 44-56.000.

Cozzy, Thomas W.: *See—*
Patenaude, Raymond A.; Cozzy, Thomas W.; and Bullis, Stéphen J., 4,294,158, Cl. 89-12.000.

Cramm, Gunther; and Blocher, Karl H., to Bayer Aktiengesellschaft. Production of thiocarbohydrazide on a commercial scale. 4,294,985, Cl. 564-18.000.

Creusot-Loire: *See—*
Pere, Gerard, 4,294,683, Cl. 204-258.000.

Crompton & Knowles Corporation: *See—*
Nims, Philip A.; and Bollinger, Roger K., 4,294,291, Cl. 139-438.000.

Crosbie, Scott C. Sighting device with means for reflecting and superimposing light flashes on a viewed object. 4,294,445, Cl. 272-8.00M.

Cross, Barrington: *See—*
Spatz, David M.; and Cross, Barrington, 4,294,986, Cl. 564-52.000.

Crotti, Bianca M. Safety door for buildings and rooms. 4,294,040, Cl. 49-254.000.

Crouzet: *See—*
Jouret, Edouard, 4,294,501, Cl. 339-66.00M.

Crowley, Albert T., to RCA Corporation. Digitally adjustable phase shifting circuit. 4,295,098, Cl. 328-24.000.

Cryogenics Unlimited: *See—*
Boese, Harold L., 4,294,323, Cl. 180-54.00B.

CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Astegiano, Luciano; and van Veen, Wouter M. D., 4,295,007, Cl. 179-7.00R.

CTS Corporation: *See—*
Lloyd, C. F.; Zalewski, Z. Leo; and Brendle, Paul C., 4,295,066, Cl. 310-30.000.

Cummins Engine Company, Inc.: *See—*
Jones, Philip E., 4,294,203, Cl. 123-195.00R.
Neff, Joseph J., 4,294,073, Cl. 60-597.000.
Peters, Lester L.; and Black, John W., 4,294,109, Cl. 73-119.00A.

Cunningham, Richard N.; and Loeffler, Romain E., deceased (by Loeffler, Carolyn R., personal representative), to Johns-Manville Corporation. Process for rapid annealing of refractory fiber bodies and laminated body produced by process. 4,294,878, Cl. 428-212.000.

Cunnington, Harry: *See—*
Figg, Anthony V. J.; and Cunnington, Harry, 4,294,645, Cl. 156-384.000.

Curran, Dennis P.: *See—*
Kende, Andrew S.; Curran, Dennis P.; King, Margaret L.; and Feldstein, Neil A., 4,294,763, Cl. 260-340.5DP.

Curry, Robert E.; and Simonsen, Michael G., to Bio-Rad Laboratories, Inc. Automatic fluorometer and data processor for performing fluorescent immunoassays. 4,295,199, Cl. 364-555.000.

Cushing, David E.: *See—*
Joyce, Thomas J.; and Cushing, David E., 4,295,202, Cl. 364-748.000.

Cutler, John H.; Espelage, Paul M.; and Walker, Loren H., to General Electric Company. Method and apparatus for dynamic braking in a motor control system. 4,295,086, Cl. 318-759.000.

Cutter Laboratories, Inc.: *See—*
Sheehan, Neil J.; and Norman, Melvin H., 4,294,249, Cl. 128-214.00G.

Cybulska, Emilia: *See—*
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

Dabby, Franklin W.; and Chesler, Ronald B., to Times Fiber Communications, Inc. Apparatus and process for automatic control of the production of optical fiber. 4,294,601, Cl. 65-3.120.

Dagnaux, Michele: *See—*
Humbert, Daniel; Clemence, Francois; and Dagnaux, Michele, 4,294,845, Cl. 424-278.00Q.

Daido Giken Industries, Co., Ltd.: *See—*
Matsuno, Ryohei, 4,294,435, Cl. 266-234.000.

Daimler-Benz Aktiengesellschaft: *See—*
Dalheimer, Walter; and Kuus, Olaf, 4,294,039, Cl. 49-248.000.
Eisele, Erwin; Charzinski, Hans-Peter; and Binder, Klaus, 4,294,209, Cl. 123-293.000.

Dalbert, Johannes: *See—*
Pittasch, Willi; and Dalbert, Johannes, 4,293,976, Cl. 16-129.000.

Dalheimer, Walter; and Kuus, Olaf, to Daimler-Benz Aktiengesellschaft. Pivotal connection for hoods and covers in motor vehicles. 4,294,039, Cl. 49-248.000.

Dallas, M. J. Whitfield for First National Bank in, executor: *See—*
Schwegman, Harry E., deceased, 4,294,313, Cl. 166-117.500.

Dam, Naim G.: *See—*
Picunko, Thomas; Kramer, Henry H.; Dam, Naim G.; and Gray, Robert I., 4,294,259, Cl. 128-653.000.

Damiano, Luigi. Traveling tool carrier for severing railway spikes. 4,294,046, Cl. 51-170.00R.

Dancot, Georges: *See—*
Hardy, Nicolas; and Dancot, Georges, 4,294,776, Cl. 260-502.00R.

Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, to Rhone-Poulenc Industries. Process for the manufacture of printing paper and board. 4,294,704, Cl. 210-651.000.

Daniel, Robert A. Combined carrying case, display device and lectern. 4,294,497, Cl. 312-231.000.

Darden, Boyd E.; and Hartley, Henry F., to Honeywell Information Systems Inc. Adapter unit for use in a data processing system for processing a variety of requests. 4,295,194, Cl. 364-200.000.

Darling, Scott L.; and Bozzuto, Carl R., to Combustion Engineering, Inc. Steam generating magnetohydrodynamic diffuser. 4,294,199, Cl. 122-276.000.

Darrow, Russell E.: *See—*
Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Poliak, Richard M., 4,294,729, Cl. 252-545.000.

Data Packaging Corporation: *See—*
Pepicelli, Pasquale L.; Lyman, George F.; and Mavilia, Robert A., 4,294,924, Cl. 435-30.000.

Datafile Limited: *See—*
Anderson, Dale L., 4,294,644, Cl. 156-361.000.

Daugherty, Edgar E.; Jackson, Kenneth W.; Jones, Wesley W.; and Subh, Naif T., to Western Electric Company, Inc. Cable splice closure. 4,295,005, Cl. 174-92.000.

Dauser, William C., Jr., to Heneveld, Lloyd A., Trustee. Wire connector. 4,295,004, Cl. 174-87.000.

Davenport, Robert W.; Moore, Eugene L.; and Goodman, Ronald L., to Johns-Manville Corporation. Apparatus and method for grinding a helical surface on a flat blade. 4,294,042, Cl. 51-54.000.

Davidson, Daniel F.: *See—*
Humphreys, Peter; Davidson, Daniel F.; and Thatcher, Gordon, 4,294,658, Cl. 376-404.000.

Davidson, James D. Solar panel window unit. 4,294,038, Cl. 49-63.000.

Davis, Paul, to Sweetheart Plastics, Inc. Sundae dish. 4,294,371, Cl. 220-4.00E.

Dawless, Robert K.; and Graziano, Robert E., to Aluminum Company of America. Fractional crystallization process. 4,294,612, Cl. 75-68.00R.

Dayco Corporation: *See—*
Vitellaro, Frank A., 4,294,636, Cl. 156-143.000.

Decoene, Frans J. G. C.; Hommez, Etienne R. O. C.; and Naaktgeboren, Adrianus, to Sperry Corporation. Baler feeder mechanism. 4,294,346, Cl. 198-740.000.

Deczky, Andrew E., to Alcan Research and Development Limited. Data acquisition systems. 4,294,682, Cl. 204-244.000.

de Figueiredo, Nuno R. M. Device for automatically controlling the infusion liquid flow in an infusion apparatus. 4,294,248, Cl. 128-214.00E.

de Jager, Christiaan L. Supports. 4,294,430, Cl. 256-58.000.

Delassus, Jean, to CEM - Compagnie Electro-Mecanique. Electromagnetic centrifuging inductor for rotating a molten metal about its casting axis. 4,294,304, Cl. 164-504.000.

Delio, Ralph D.: *See—*
Diemer, Donald J.; and Delio, Ralph D., 4,294,101, Cl. 72-356.000.

Delle-Alsthom: *See—*
Thuries, Edmond; Vernat, Pierre; and Sauvat, Roger, 4,295,023, Cl. 200-148.00R.

Delta Systems, Inc.: *See—*
Howard, William A., 4,294,327, Cl. 180-273.000.

DeLuca, Raymond F., to Georgia-Pacific Corporation. Evaporative dispenser. 4,294,778, Cl. 261-30.000.

Den-Mat, Inc.: *See—*
Ibsen, Robert L.; and Glace, William R., 4,294,349, Cl. 206-63.500.

Denis, Louis H. D.; Bedue, Abel J. H.; and Malherbaud, Jacques, to Compagnie Francaise d'Etudes et de Construction Technip. Method of and arrangement for the seasonal storage and use of hot water produced in particular by electrical power-generating thermal and nuclear stations. 4,294,311, Cl. 165-104.00S.

Dennehey, T. Michael, to Baxter Travenol Laboratories, Inc. Luer lock connection device. 4,294,250, Cl. 128-247.000.

Denzinger, Walter: *See—*
Hartmann, Juergen; Stedefeder, Joachim; Denzinger, Walter; and Pfohl, Sigberg, 4,294,873, Cl. 427-391.000.

Desbrandes, Robert; and Grolet, Pierre, to Institut Francais du Petrole. Device for measuring the stresses applied in use to the downhole assembly of a drill pipe. 4,294,318, Cl. 175-321.000.

DeSoto, Inc.: *See—*
Sekmakas, Kazys; and Shah, Raj, 4,294,737, Cl. 260-29.2EP.
Wood, Donald C.; and McLaughlin, Robert L., 4,294,855, Cl. 424-358.000.

Desplats, Andre, to Tractel S.A. Pulley assembly for improving the cooperation between a winch and a cable actuated thereby. 4,294,429, Cl. 254-272.000.

Detroit Bank & Trust Co., executor: *See—*
McIntosh, Lester A., deceased, 4,294,439, Cl. 267-54.00A.

Deutsche Babcock Aktiengesellschaft: *See—*
Buchmuller, Horst; and Michelbrink, Bernhard, 4,294,592, Cl. 55-120.000.

Deutsche Gold-und Silber-Scheideanstalt vormals Roessler: *See—*
Bozon, Alfred; Koberstein, Edgar; Pletka, Hans-Dieter; Volker, Herbert; and Lakatos, Eduard, 4,294,726, Cl. 252-462.000.

Dewar, Colin A.: *See—*
Hardy, Frederick E.; and Dewar, Colin A., 4,294,710, Cl. 252-8.800.

Dexon, Inc.: *See*—
Intrater, Josef; Bertholdo, Gene; and Intrater, Janet, 4,294,271, Cl. 134-113.000.
Deyrup, Edward J.: *See*—
Berr, Charles E.; and Deyrup, Edward J., 4,294,938, Cl. 525-101.000.
Dickason, Alan F.: *See*—
Rugen, Donald F.; and Dickason, Alan F., 4,294,742, Cl. 260-31.80H.
Diehl GmbH & Co.: *See*—
Rauschert, Willi; Rieger, Gerald; Bock, Erich; and Eckel, Alfred, 4,294,172, Cl. 102-473.000.
Diemer, Donald J.; and Delio, Ralph D. Method of making single or double flanged track tractor roller for off-highway equipment. 4,294,101, Cl. 72-356.000.
Diermayer, Werner; Kutzner, Luitpold; and Postenreider, Erwin. Draft control arrangement. 4,294,401, Cl. 236-1.00G.
Dimaggio, Richard J.: *See*—
Copeland, Robert K.; and Dimaggio, Richard J., 4,295,198, Cl. 364-515.000.
Dr. Ing. h.c. F. Porsche Aktiengesellschaft: *See*—
Striebich, Helmut, 4,294,074, Cl. 60-616.000.
Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, to Chemische Werke Huls Aktiengesellschaft. Process for the production of powdery, thermoplastic copolymers from ethylene and butene-(1). 4,294,947, Cl. 526-119.000.
Doi, Yoshikazu; Sakai, Yutaka; and Ohno, Kazunori, to Fuji Photo Optical Co., Ltd. Rear stop type zoom lens. 4,294,521, Cl. 350-426.000.
Doll, Thomas; Schacht, Erich; Radunz, Hans-Eckart; and Schulze, Ernst, to Merck Patent Gesellschaft mit beschrankter Haftung. Benzothiazole derivatives and pharmaceutical formulations containing them. 4,294,839, Cl. 424-263.000.
Dombrowski, Leonard C., to Bell Telephone Laboratories, Incorporated. High speed driver for optoelectronic devices. 4,295,226, Cl. 455-618.000.
Doner, Claude E.: *See*—
Carter, Don R.; Doner, Claude E.; Hammersand, Fred G.; and Tomcavage, Joseph R., 4,295,077, Cl. 313-293.000.
Donley, William B., to General Motors Corporation. Programming an IGFET read-only-memory. 4,295,209, Cl. 365-178.000.
Dopkin, Joseph A.: *See*—
Treible, Edwin S.; Dopkin, Joseph A.; and Alford, Raymond N., 4,294,214, Cl. 123-458.000.
Dorsen, Mac; and Saltzman, Philip A., to Stupell Industries, Ltd. Handbag construction. 4,294,299, Cl. 150-28.00R.
Dow Chemical Company, The: *See*—
Henson, Thomas R.; and Timberlake, John F., 4,294,774, Cl. 260-453.00P.
Stone, Frederick C.; and Schupska, Gary G., 4,294,968, Cl. 546-251.000.
Tamony, Andree E.; and Youngson, Charles R., Jr., 4,294,928, Cl. 423-235.000.
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Dragerwerk Aktiengesellschaft: *See*—
Leichnitz, Kurt, 4,294,583, Cl. 23-232.00R.
Pasternack, Adalbert, 4,294,244, Cl. 128-202.260.
Draper, Don R.; and Kusulas, Peter, Jr., to Bell Telephone Laboratories, Incorporated. Memory write error detection circuit. 4,295,219, Cl. 371-51.000.
Drennan, Arthur P.: *See*—
Arons, Irving J.; Merrill, Richard E.; and Drennan, Arthur P., 4,294,792, Cl. 264-311.000.
Dresser Industries, Inc.: *See*—
Sprott, Kenneth J.; and Herterick, George M., 4,294,113, Cl. 73-199.000.
Dria, Dennis E.: *See*—
Bremer, Noel J.; and Dria, Dennis E., 4,294,722, Cl. 252-435.000.
Drixler, Karl, to Chr. Eisele Maschinenfabrik GmbH. & Co. KG. Guards for circular saw blades of circular sawing machines. 4,294,148, Cl. 83-397.000.
Drouin, Gilbert; and Sibille, Jacques, to Ecole Polytechnique. Extensometer. 4,294,015, Cl. 33-174.00D.
Drugmand, Lester D., to Electro-Therm, Inc. Double-grip mounting means for sheathed heating elements. 4,295,035, Cl. 219-536.000.
DuBois, Chester G.; and Hulsebus, Richard P., to Outboard Marine Corporation. Temperature compensator for a carburetor choke valve. 4,294,780, Cl. 261-39.00B.
DuBord, Edward W.: *See*—
Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., 4,294,798, Cl. 422-62.000.
Ducharme, Gilles H., to Du Pont de Nemours, E. I., and Company. Explosives package for coupled cast primer compositions. 4,294,171, Cl. 102-317.000.
Dulaney, Donald C.; and Bowman, John A., to Rust-Oleum Corporation. Method of producing pigmented silicate coatings. 4,294,619, Cl. 106-188.000.
Dunlop Limited: *See*—
Kenney, Michael J., 4,294,730, Cl. 260-17.4BB.
Duo-Fast Corporation: *See*—
Obergfell, Allen R., 4,294,391, Cl. 227-130.000.
Du Pont de Nemours, E. I., and Company: *See*—
Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., 4,294,489, Cl. 297-452.000.
Beresniewicz, Aleksander, 4,294,738, Cl. 260-29.4UA.
Berr, Charles E.; and Deyrup, Edward J., 4,294,938, Cl. 525-101.000.
Bratt, Martin D.; and Oakley, John F., 4,294,533, Cl. 354-318.000.
Burgess, William H., III; and Heiberger, Philip, 4,294,736, Cl. 260-22.00M.
Copelin, Harry B., 4,294,998, Cl. 568-868.000.
Ducharme, Gilles H., 4,294,171, Cl. 102-317.000.
Graham, William F., 4,294,743, Cl. 260-32.8EP.
Graham, William F., 4,294,877, Cl. 428-209.000.
Harris, John F., Jr., 4,294,955, Cl. 528-176.000.
Lee, Ross A., 4,294,909, Cl. 430-291.000.
Lovell, Peter J.; and Saunders, Ian C. B., 4,294,794, Cl. 264-328.100.
Stock, Albert M.; and Verbsky, James D., 4,294,997, Cl. 568-855.000.
Urquhart, Thomas, 4,294,646, Cl. 156-500.000.
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., to Smith Kline & French Laboratories Limited. Pharmaceutical compositions. 4,294,854, Cl. 424-326.000.
Durkee, Richard G. Heavy metal removal apparatus. 4,294,434, Cl. 266-170.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Brede, Uwe; and Kern, Heinz, 4,294,648, Cl. 156-627.000.
Dynatrol Consultants (U.K.) Limited: *See*—
Thompson, Raymond V.; Todd, Alan; and Constantine, Albert B., 4,294,549, Cl. 366-164.000.
Dyneer Corporation: *See*—
St. John, Richard C., 4,294,342, Cl. 192-105.0CD.
E M I Limited: *See*—
Hounsfield, Godfrey N., 4,295,195, Cl. 364-414.000.
E. R. Squibb & Sons, Inc.: *See*—
Vellucci, Enzo, 4,294,894, Cl. 424-49.000.
Eagle-Picher Industries, Inc.: *See*—
Hayes, Richard H., 4,294,144, Cl. 83-71.000.
Eastman Kodak Company: *See*—
Adin, Anthony; Boettcher, John W.; and Fleming, James C., 4,294,912, Cl. 430-341.000.
Bechle, Philip D.; and Roth, Joseph A., 4,294,906, Cl. 430-207.000.
Bellas, Michael; and Cahill, Robert, 4,294,991, Cl. 568-650.000.
Fyson, John R., 4,294,914, Cl. 430-418.000.
Guild, John R., 4,294,911, Cl. 430-326.000.
Hyatt, John A., 4,294,761, Cl. 260-338.000.
Paxton, Kenneth B., 4,294,536, Cl. 355-14.00C.
Peffer, Robert M.; and Braun, Charles H., 4,294,104, Cl. 73-9.000.
Upson, Donald A.; Campbell, Gerald A.; and Kestner, Diane E., 4,294,739, Cl. 260-29.6RW.
Eaton Corporation: *See*—
Lade, Robert W.; Spellman, Gordon B.; Jaskolski, Stanley V.; Schutten, Herman P.; and Jaeschke, James R., 4,295,058, Cl. 307-252.00A.
Pohl, Walter, 4,295,114, Cl. 337-3.000.
Ebara Corporation: *See*—
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.
Ebauches S.A.: *See*—
Luscher, Jacob, 4,295,056, Cl. 307-221.00C.
Eberle, Jurg: *See*—
Stauber, Hans-Ulrich; and Eberle, Jurg, 4,294,345, Cl. 198-683.000.
Eberle, William J., to General Battery Corporation. Tumble dumper. 4,294,292, Cl. 141-1.000.
Ebersberger, Otto; and Kuehnel, Werner, to Siemens Aktiengesellschaft. X-Ray diagnostic generator with an inverter supplying the high-tension transformer. 4,295,049, Cl. 250-409.000.
Eckart, Erich G. Safety ski binding comprising a sole plate. 4,294,461, Cl. 280-618.000.
Eckel, Alfred: *See*—
Rauschert, Willi; Rieger, Gerald; Bock, Erich; and Eckel, Alfred, 4,294,172, Cl. 102-473.000.
Eckhardt, Fritz; and Schonherr, Walter, to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen m.b.H. Electric lamp with cementless attached base. 4,295,076, Cl. 313-223.000.
Ecole Polytechnique: *See*—
Drouin, Gilbert; and Sibille, Jacques, 4,294,015, Cl. 33-174.00D.
Edwards, Merle L., to FMC Corporation. Light weight snow thrower. 4,294,027, Cl. 37-43.00R.
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N. Apparatus for manufacturing steel spring leaves. 4,294,098, Cl. 72-128.000.
Ehrenreich, Leo C.: *See*—
Klingaman, Richard M.; and Ehrenreich, Leo C., 4,294,750, Cl. 260-40.00R.
Eibner, Jules A.; and Kanamuller, Franz X., to Sperry Corporation. Fiber optic cable connector. 4,295,043, Cl. 250-227.000.
Eibofner, Eugen, to Kaltenbach & Voight GmbH & Co. Servicing composition for spraying on medical instruments. 4,294,797, Cl. 422-36.000.
Eida, Toshiaki: *See*—
Hidaka, Hidemasa; Kohno, Toshiaki; and Eida, Toshiaki, 4,294,623, Cl. 127-55.000.
Einset, Eystein. Ostomy device. 4,294,252, Cl. 128-283.000.
Eisele, Erwin; Charzinski, Hans-Peter; and Binder, Klaus, to Daimler-Benz Aktiengesellschaft. Internal combustion engine. 4,294,209, Cl. 123-293.000.
EKA AB: *See*—
Sunden, Olof, 4,294,885, Cl. 428-404.000.

Ekman Engineering AG: *See—*
Ekman, Kjell R., 4,294,473, Cl. 285-50.000.
Ekman, Kjell R., to Ekman Engineering AG. Device at mutually lockable first and second parts. 4,294,473, Cl. 285-50.000.
Electric Power Research Institute: *See—*
Stolecki, William E., 4,294,472, Cl. 285-27.000.
Electric Power Research Institute, Inc.: *See—*
Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,294,685, Cl. 208-10.000.
Randolph, Alan D., 4,294,807, Cl. 423-242.000.
Electro-Therm, Inc.: *See—*
Drugmand, Lester D., 4,295,035, Cl. 219-536.000.
Electrochemische Energieconversie, N.V.: *See—*
Alfenaar, Marinus, 4,294,892, Cl. 429-13.000.
Electrolux Corporation: *See—*
Bowerman, Leonard E., 4,294,595, Cl. 55-213.000.
Electrolyser Corporation Ltd., The: *See—*
LeRoy, Rodney L., 4,294,274, Cl. 137-7.000.
Electronic Systems Engineering, Inc.: *See—*
Anderson, Kenneth W.; Summerhays, Brent; and Cazier, Verl O., 4,295,044, Cl. 250-229.000.
Electronics Corporation of America: *See—*
Cade, Phillip J., 4,295,129, Cl. 340-520.000.
Eli Lilly and Company: *See—*
Matsumoto, Ken, 4,294,964, Cl. 544-249.000.
Elliott, Thomas J.; and Ford, David, to Beecham Group Limited. Astringent or degreasing lotion. 4,294,823, Cl. 424-78.000.
Ellis, Paul R., Jr., to GTE Automatic Electric Laboratories, Inc. Method of mounting thick film hybrid circuits in printed circuit boards. 4,294,007, Cl. 29-830.000.
Ellsworth, James P.: *See—*
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Elser, Wolfgang: *See—*
Mensch, Siegfried; Epple, Gerhard; and Elser, Wolfgang, 4,294,581, Cl. 8-611.000.
Embleton, Tony F. W.: *See—*
Baldwin, Stanley L.; Hampton, Vernon; and Embleton, Tony F. W., 4,294,330, Cl. 181-230.000.
Emco Wheaton Inc.: *See—*
Rabinovich, Evsey, 4,294,378, Cl. 220-323.000.
Emerson Electric Co.: *See—*
Hansen, John M., 4,294,044, Cl. 51-135.0BT.
Emhart Industries, Inc.: *See—*
Winzer, Frederick W.; and Ault, James R., 4,294,603, Cl. 65-346.000.
Energy Systems Corporation: *See—*
Mayo, Kenneth E., 4,294,225, Cl. 126-204.000.
Eng, George: *See—*
Klein, David I., 4,294,035, Cl. 46-227.000.
Engelhard, Thomas E. Window boot. 4,294,485, Cl. 296-166.000.
Enomoto, Minoru; Yoneda, Takoao; and Takeuchi, Yoshiyuki, to Toyoda Koki Kabushiki Kaisha. Grinding machine with a sizing device. 4,294,045, Cl. 51-165.710.
Enomoto, Satoru: *See—*
Takita, Hitoshi; Mukaida, Yutaka; and Enomoto, Satoru, 4,294,770, Cl. 260-413.000.
Enser, Mats A.; Hallberg, Lars O.; and Stalberg, Nils G., to International Business Machines Corporation. Device for optical character reading. 4,295,121, Cl. 340-146.3MA.
Envirex Inc.: *See—*
Casper, Thomas J., 4,294,700, Cl. 210-403.000.
Envirotech Corporation: *See—*
Kahl, Melvin R., 4,294,591, Cl. 55-120.000.
Epicure Products Inc.: *See—*
Hathaway, Dana B., 4,295,011, Cl. 179-115.5VC.
Epple, Gerhard: *See—*
Mensch, Siegfried; Epple, Gerhard; and Elser, Wolfgang, 4,294,581, Cl. 8-611.000.
Erickson, John W.; and Petrie, Harold L., to Kobe, Inc. Submersible electrically powered centrifugal and jet pump assembly. 4,294,573, Cl. 417-83.000.
Erkfritz, Donald S., to General Electric Company. Indexable finishing insert for a milling cutter. 4,294,565, Cl. 407-113.000.
Ernst, Horst M.: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schulz, Toni, 4,294,100, Cl. 72-340.000.
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., to United States of America, Air Force. Respirators. 4,294,243, Cl. 128-201.180.
Errichiello, Dominic R. Book binders and books made with said binders. 4,294,469, Cl. 281-29.000.
Errichiello, Dominic R. Weatherproof portfolios. 4,294,558, Cl. 402-75.000.
Escher Wyss Limited: *See—*
Biondetti, Mario, 4,293,988, Cl. 29-116.0AD.
Eschinasi, Emile H.; and Castelli, Enrico, to Instituto per la Ricerca Scientifica e Applicata di Technologie Alimentari S.p.A. Process for the preparation of 2,5-dimethyl-4-hydroxy-3(2H)-furanone and its 2,5-dialkyl homologues. 4,294,767, Cl. 260-347.800.
Espejo, Eusebio H. Camper and tent unit. 4,294,486, Cl. 296-167.000.
Espelage, Paul M.: *See—*
Cutler, John H.; Espelage, Paul M.; and Walker, Loren H., 4,295,086, Cl. 318-759.000.
Espley, David J. C.: *See—*
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Remond, Jean R. A., 4,294,028, Cl. 40-359.000.
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Bronnec, Jean A. L., 4,294,698, Cl. 210-242.300.
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Jewusiak, Stephen J.; Beroff, Howard; and Schuler, Michael, 4,294,355, Cl. 206-339.000.
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McKinnie, Bonnie G., 4,294,775, Cl. 260-455.00R.
Ettridge, John P. Child's stroller. 4,294,464, Cl. 280-649.000.
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Riebel, Hans-Jochem; Eue, Ludwig; and Faust, Wilfried, 4,294,967, Cl. 546-242.000.
Evans, Arthur J., to Whitlock, Inc. Plenum drying hopper with integral heaters. 4,294,020, Cl. 34-168.000.
Evans, Robert F. Caliper seal assembly. 4,294,492, Cl. 308-8.200.
Evans, Thomas E., to Honeywell Inc. Peak detector. 4,295,099, Cl. 328-151.000.
Everett, Gary L.: *See—*
Pinaire, Ronald; and Everett, Gary L., 4,294,687, Cl. 208-58.000.
Evrard, Thomas O., to Olin Corporation. Use of selected N-(2,6-dimethylphenyl)-alanine methyl ester compounds as ammonium nitrification compounds. 4,294,604, Cl. 71-27.000.
Evva Werk Spezialerzeugung von Zylinder- und Sicherheitsschlossern Gesellschaft m.b.H. & Co. Kommanditgesellschaft: *See—*
Prunbauer, Kurt, 4,294,091, Cl. 70-276.000.
Exxon Production Research Company: *See—*
Mifsud, Joseph F., 4,295,213, Cl. 367-41.000.
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Kelly, Arnold J., 4,294,105, Cl. 73-28.000.
Klein, Robert R.; and Makowski, Henry S., deceased, 4,294,744, Cl. 260-33.6AQ.
Mayer, Francis X., 4,294,688, Cl. 208-164.000.
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Ezhov, Evgeny I.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.
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Fairlie-Clarke, Anthony C., to Vickers Limited. Liquid flow detecting device. 4,295,134, Cl. 340-610.000.
Faler, Gary R.; and Loucks, George R., to General Electric Company. Method and catalyst for making bisphenol. 4,294,995, Cl. 568-728.000.
Falk, Filip; and Falk, Lennart. Dispenser for rolls of paper. 4,294,389, Cl. 225-34.000.
Falk, Lennart: *See—*
Falk, Filip; and Falk, Lennart, 4,294,389, Cl. 225-34.000.
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, to Politechnika Gdanska. Water-soluble salts of trimethylammonium derivatives of polyene macrolide antibiotics and the preparation thereof. 4,294,958, Cl. 536-17.00R.
Farah, Alfred E., to Sterling Drug Inc. Ketazocine anesthetic method of use. 4,294,840, Cl. 424-267.000.
Farr, Glyn P. R., to Lucas Industries Limited. Master cylinder assemblies. 4,294,070, Cl. 60-534.000.
Faust, Wilfried: *See—*
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Feffer, Philip C., to Chevron Research Company. Method and apparatus for making bounce crimped yarn. 4,293,985, Cl. 28-254.000.
Feinberg, Emanuel. Automatic furnace vent damper control. 4,294,226, Cl. 126-286.000.
Feldman, Fred, to Armour Pharmaceutical Company. Process for the preparation of highly purified antihemophilic factor. 4,294,826, Cl. 424-101.000.
Feldstein, Neil A.: *See—*
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Felten & Guilleaume Carlswerk: *See—*
Schmitz, Gunther; and Kierdorf, Hans, 4,294,064, Cl. 57-3.000.
Fennel, John W., Jr.; Hallett, Robert J.; Head, Stanley M.; and Melas, Constantine M., to International Business Machines Corporation. Apparatus to reduce the effect of a mid-talkspurt freeze-out. 4,295,217, Cl. 370-81.000.
Ferag AG: *See—*
Stauber, Hans-Ulrich; and Eberle, Jurg, 4,294,345, Cl. 198-683.000.
Ferraris Development and Engineering Company Limited: *See—*
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Ferraro, Frank A.: *See—*
Chen, Evan N.; and Ferraro, Frank A., 4,294,010, Cl. 30-42.000.

Ferri, Giampiero. Ammunition for a toy weapon. 4,294,173, Cl. 102-281.000.
Ferris, Sean D. Inflatable vehicle cover. 4,294,483, Cl. 296-136.000.
Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 4,294,488, Cl. 297-367.000.
Fetterly, Richard V.: *See—*
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Feuerherd, Karl-Heinz: *See—*
Koenig, Karl-Heinz; Feuerherd, Karl-Heinz; and Oeser, Heinz-Guenter, 4,294,773, Cl. 260-453.00P.
Figg, Anthony V. J.; and Cunnington, Harry, to Norprint Limited. Label applicators. 4,294,645, Cl. 156-384.000.
Filipiak, Stanley E.: *See—*
Keeler, Robert J.; and Filipiak, Stanley E., 4,295,012, Cl. 200-5.00B.
Finsterwalder, Lorenz, to Gesellschaft zur Wiederaufarbeitung von Kernbrennstoffen mbH. Apparatus for the controllable removal of one or more phases from a liquid-liquid extractor. 4,294,702, Cl. 210-513.000.
Fiquet, Claire: *See—*
Vanlerberghe, Guy; Sebag, Henri; and Fiquet, Claire, 4,294,728, Cl. 252-542.000.
Fischell, David R.; and Mazique, Jeffrey C., to United States of America, National Aeronautics and Space Administration. Cervix-to-rectum measuring device in a radiation applicator for use in the treatment of cervical cancer. 4,294,264, Cl. 128-778.000.
Fischer, Armin O., to American Standard Inc. Flow control device. 4,294,289, Cl. 138-44.000.
Fischli, Albert E.; and Szente, Andre, to Hoffmann-La Roche Inc. 7-Isocyanato-1,4-benzodiazepin-2-ones. 4,294,758, Cl. 260-239.30D.
Fisher, Ernest P., Jr.: *See—*
Yonker, John H.; Fisher, Ernest P., Jr.; and Bills, David, 4,294,315, Cl. 166-322.000.
Fisher, Ian P.; Woods, H. John; and Souhrada, Frank, to Gulf Canada Limited. Process for upgrading heavy hydrocarbonaceous oils. 4,294,686, Cl. 208-56.000.
Fitzke, Rudolf. Catastrophic-exposure emergency kit. 4,294,352, Cl. 206-223.000.
Flack, Max L.: *See—*
Best, Walter E.; Foshee, William R.; and Flack, Max L., 4,294,093, Cl. 70-369.000.
Flautt, Robert A.: *See—*
Reynoir, Ronald H.; Flautt, Robert A.; and Leavitt, Clyde M., 4,294,331, Cl. 182-10.000.
Fleischer, Henry. Unique joint especially useful with juvenile furniture and playthings. 4,294,426, Cl. 248-561.000.
Fleming, James C.: *See—*
Adin, Anthony; Boettcher, John W.; and Fleming, James C., 4,294,912, Cl. 430-341.000.
Flesburg, Edward E., to Caterpillar Tractor Co. Sand core pattern and method of forming a sand mold. 4,294,303, Cl. 164-44.000.
Flynn, Derek J., to Lucas Industries Limited. Master cylinder and reservoir assemblies. 4,294,072, Cl. 60-585.000.
FMC Corporation: *See—*
Bagnall, Elizabeth A.; Guiliano, Basil A.; and Pfeffer, Henry A., III, 4,294,962, Cl. 544-192.000.
Edwards, Merle L., 4,294,027, Cl. 37-43.00R.
Stilwell, Robert E.; and Westerling, David E., 4,294,059, Cl. 53-448.000.
Foam Controls, Inc.: *See—*
Szeliga, Philip C., 4,294,277, Cl. 137-101.190.
Focke & Co.: *See—*
Focke, Heinz H.; and Liedtke, Kurt, 4,294,353, Cl. 206-273.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Pfuhl. Process for the production of package for cigarettes or the like. 4,294,642, Cl. 156-250.000.
Focke, Heinz H.; and Liedtke, Kurt, to Focke & Co. Side connected cigarette half-packs. 4,294,353, Cl. 206-273.000.
Focke & Pfuhl: *See—*
Focke, Heinz; and Liedtke, Kurt, 4,294,642, Cl. 156-250.000.
Fogle, Ozzie, to Champion International Corporation. Applicator for direct roll coating. 4,294,187, Cl. 118-244.000.
Foley, John T.: *See—*
Bilstad, Arnold C.; and Foley, John T., 4,294,320, Cl. 177-1.000.
Ford, David: *See—*
Elliott, Thomas J.; and Ford, David, 4,294,823, Cl. 424-78.000.
Ford Motor Company: *See—*
Boaz, Premakaran T., 4,294,867, Cl. 427-96.000.
Fox, David H.; and Kostan, Charles C., 4,295,014, Cl. 200-19.00R.
Hurley, John J., 4,294,133, Cl. 74-501.00P.
Meyer, John H.; and Guerra, Salvatore, 4,294,881, Cl. 428-334.000.
Fory, Werner: *See—*
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Foshee, William R.: *See—*
Best, Walter E.; and Foshee, William R., 4,294,089, Cl. 70-150.000.
Best, Walter E.; Foshee, William R.; and Flack, Max L., 4,294,093, Cl. 70-369.000.
Foster Wheeler Energy Corporation: *See—*
Gorzegno, Walter P., 4,294,200, Cl. 122-406.00S.
Fouse, Jack A.; and McClaren, Sherwood W., III, to Vought Corporation. Airframe assembly and process. 4,294,419, Cl. 244-117.00R.
Fowler, Donald W.; and Clelford, Douglas H., to United Technologies Corporation. Force feel actuator fault detection with directional threshold. 4,294,162, Cl. 91-434.000.
Fox, Barry C.: *See—*
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.
Fox, David H.; and Kostan, Charles C., to Ford Motor Company. Ignition distributor with integral common electrode, shaft bearing and high voltage terminal connector. 4,295,014, Cl. 200-19.00R.
Fraenkel, Dan; and Gates, Bruce C., to University of Delaware. Catalyst, method for catalyst manufacture and use. 4,294,725, Cl. 252-455.00Z.
Framatome: *See—*
Guignard, Paul; and Commeau, Alain, 4,294,662, Cl. 219-61.000.
Franconi, Cafiero: *See—*
Bonori, Maurizio; and Franconi, Cafiero, 4,295,131, Cl. 340-554.000.
Frank, James P., to General Electric Company. Method of assembling a switch and terminal assembly. 4,294,004, Cl. 29-622.000.
Frantom, Richard L., to Allied Chemical Corporation. Seat belt comfort device. 4,294,467, Cl. 280-801.000.
Frantz, Gene A.: *See—*
Chang, Richard R.; Frantz, Gene A.; and Hawkins, William R., 4,295,181, Cl. 361-395.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Riessberger, Klaus, 4,294,041, Cl. 51-5.00C.
Frazier, Calvin H. Splint for reducing fractures of the metacarpals. 4,294,237, Cl. 128-77.000.
Fredriksson, Borje I.: *See—*
Bohlin, Karl G.; Fredriksson, Borje I.; Karlsson, Kent A. B.; and Nelvig, Lars T., 4,294,412, Cl. 241-30.000.
Freeman, Charles F.; and Villhauer, Kurt, to United States of America, Army. Microchannel plate-in-wall structure. 4,295,073, Cl. 313-105.0CM.
Freeman, Robert W.: *See—*
Tavlarides, Lawrence L.; Freeman, Robert W.; and Hsia, Alexander M., 4,294,800, Cl. 422-68.000.
Freisler, Erhard, to Ruti Machinery Works Ltd. Process and loom for the production of pile fabrics. 4,294,290, Cl. 139-26.000.
Friese, Axel, to Carl Hahn, G.m.b.H. Tampon with a non-woven wrap. 4,294,253, Cl. 128-285.000.
Froehlig, Guy M., to Bauer, Jerome; and Amer, Myron. Method for substantially instantaneous liquid molding of an article. 4,294,782, Cl. 264-1.400.
Frommelt Industries, Inc.: *See—*
Frommelt, Sylvan J., 4,293,969, Cl. 14-71.100.
Frommelt, Sylvan J., to Frommelt Industries, Inc. Inflatable seal. 4,293,969, Cl. 14-71.100.
Frost, Henry F.: *See—*
Jones, William A.; Hing Yuen, Tse Lin Sin Tse; Rytomaa, Tapio; Harper, Norman J.; and Frost, Henry F., 4,294,824, Cl. 424-101.000.
Fry, Timothy S., to GKN Group Services Limited. Wheel support assembly. 4,294,326, Cl. 180-255.000.
Fuji Electric Co., Ltd.: *See—*
Obata, Toshiharu; Hagyu, Toshimasa; and Kojima, Hisao, 4,294,396, Cl. 228-245.000.
Fuji Photo Film Co., Ltd.: *See—*
Aono, Toshiaki, 4,294,900, Cl. 430-7.000.
Inoue, Eiichi; Shimizu, Isamu; and Shizukuishi, Makoto, 4,294,520, Cl. 350-357.000.
Ohba, Hisao; Oda, Kazutaka; Yabuta, Yukio; and Ohashi, Azusa, 4,294,672, Cl. 204-129.400.
Okishi, Yoshio; Koike, Akinobu; and Miyano, Shizuo, 4,294,905, Cl. 430-175.000.
Tsujino, Nobuyuki; and Hirano, Shigeo, 4,294,919, Cl. 430-559.000.
Watanabe, Shigeru; and Kuzunuki, Tatsuo, 4,295,042, Cl. 250-226.000.
Yagihara, Morio; and Yokota, Yukio, 4,294,918, Cl. 430-553.000.
Yamaguchi, Jun; Naoi, Takashi; Sera, Hidefumi; Ishigaki, Kunio; and Ogawa, Masasi, 4,294,921, Cl. 430-621.000.
Fuji Photo Optical Co., Ltd.: *See—*
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Fujii, Hiroyuki: *See—*
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Fujisawa, Hidetaka, to Casio Computer Co., Ltd. Music tone generating system. 4,294,154, Cl. 84-1.010.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,294,960, Cl. 544-22.000.
Fujita, Mitsuo; and Matsumura, Koji, to Victor Company of Japan, Ltd. System for controlling rotational direction switchover and for variably controlling rotational speed of motor. 4,295,080, Cl. 318-257.000.
Fujitsu Limited: *See—*
Ohmura, Sohshi, 4,294,651, Cl. 156-662.000.
Fujiwara, Ichiroh; Motoki, Yoshiaki; Inoue, Toshinori; and Fukuoka, Kazuma, to Mitsubishi Denki Kabushiki Kaisha. Repeat type time switch. 4,295,015, Cl. 200-38.00R.
Fukada, Tetsuji; and Ise, Yukihiko, to Matsushita Electric Industrial Co., Ltd. Rotary magnetic head apparatus. 4,295,172, Cl. 360-109.000.

Fukahori, Hidehiko: *See—*
Iwashita, Tomonori; Fukahori, Hidehiko; and Mashimo, Yukio, 4,294,530, Cl. 354-173.000.

Fukuda, Hiroyuki: *See—*
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,294,795, Cl. 264-332.000.

Fukui, Seiji, to Shimano Industrial Company, Limited. Two stage transmission hub for a bicycle. 4,294,138, Cl. 74-750.00B.

Fukuoka, Kazuma: *See—*
Fujiwara, Ichiroh; Motoki, Yoshiaki; Inoue, Toshinori; and Fukuoka, Kazuma, 4,295,015, Cl. 200-38.00R.

Fuller, Mary L., to Ralston Purina Company. Dog food compositions of improved palatability to dogs. 4,294,857, Cl. 426-99.000.

Funari, Joseph: *See—*
Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Poliak, Richard M., 4,294,729, Cl. 252-545.000.

Funck, Willi; Verheyen, Roland; and Schedler, Heinz, to Schloemann-Siemag Aktiengesellschaft. Overload safety device in hydraulic forming presses, in particular sheet metal form drawing presses. 4,294,103, Cl. 72-453.140.

Furlette, James L.; and Stadler, Donald A. Automatic accumulating lift and carry transfer mechanism. 4,294,347, Cl. 198-751.000.

Furr, Danny L., to Phillips Petroleum Company. Fractional distillation column control. 4,295,196, Cl. 364-501.000.

Fuson, Robert L., to Zimmer USA, Inc. Bone plug inserting system. 4,293,962, Cl. 3-1.900.

Futaba Denshi Kogyo K.K.: *See—*
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Futatsumori, Koji: *See—*
Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, 4,294,975, Cl. 556-482.000.

Fyson, John R., to Eastman Kodak Company. Photographic bleach compositions and methods of photographic processing. 4,294,914, Cl. 430-418.000.

G. D. Searle & Co.: *See—*
Wagner, Hans A., 4,294,830, Cl. 424-251.000.

G. L. Rexroth GmbH: *See—*
Mark, Edgar, 4,295,000, Cl. 13-13.000.

Gado, Istvan: *See—*
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GAF Corporation: *See—*
Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., 4,294,848, Cl. 424-302.000.

Gaffney, Edward N., to Lucas Industries Limited. Terminal connector for an electric storage battery. 4,294,505, Cl. 339-231.000.

Gage, Millard E.; and Landers, Derek J., to Bendix Corporation, The. Ignition switch. 4,295,013, Cl. 200-11.00C.

Gaidis, James M.; and Rosenberg, Arnold M., to W. R. Grace & Co. Process for forming calcium nitrite. 4,294,813, Cl. 423-385.000.

Gajjar, Jagdishchandra T., to Integrated Energy Systems. Environmental control system. 4,294,404, Cl. 236-49.000.

Galaske, Folker; and Hack, Oswald, to International Standard Electric Corporation. Multi-row keyboard for typewriters or similar machines. 4,294,555, Cl. 400-488.000.

Gallic, John. Golf training aid and game. 4,294,450, Cl. 273-176.00F.

Gamble, Bruce B., to General Electric Company. Cantilevered field winding support for a superconducting AC machine. 4,295,068, Cl. 310-52.000.

Ganellin, Charon R.: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,294,854, Cl. 424-326.000.

Ganser, Volker: *See—*
Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, 4,294,834, Cl. 424-260.000.

Ganster, Otto: *See—*
Grogler, Gerhard; Schwindt, Jurgen; Ganster, Otto; Meiners, Hans-Joachim; and Ruprecht, Hans-Dieter, 4,294,934, Cl. 521-160.000.

Gardner, Hugh C., to Union Carbide Corporation. Polyester resin compositions. 4,294,751, Cl. 260-400.00R.

Garfield, Nathaniel H.: *See—*
McSherry, Thomas W.; and Garfield, Nathaniel H., 4,294,156, Cl. 411-345.000.

Garrison, Mark R.: *See—*
Martinelli, Lawrence G.; and Garrison, Mark R., 4,294,640, Cl. 156-213.000.

Gates, Bruce C.: *See—*
Fraenkel, Dan; and Gates, Bruce C., 4,294,725, Cl. 252-455.00Z.

Gates Rubber Company, The: *See—*
Uba, Toshio, 4,295,029, Cl. 219-75.000.

Gavin, David F.: *See—*
Knollmueller, Karl O.; Fairbrother, Robert J.; and Gavin, David F., 4,294,713, Cl. 252-28.000.

Gazda, Hans O. E. Apparatus for the separation of gas mixtures, particularly the enrichment of a gas mixture in a component containing uranium 235. 4,294,598, Cl. 55-403.000.

Geary, Carl H., Jr., to Carrier Corporation. Method for securing a wheel to a rotatable shaft. 4,293,996, Cl. 29-446.000.

Gebruder Loepfe AG: *See—*
Stutz, Hansruedi, 4,294,545, Cl. 356-386.000.

Gebrueder Buehler AG: *See—*
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Geiger, Jack M.: *See—*
Greenwald, A. Seth; Geiger, Jack M.; Narten, Nathaniel C.; Porritt, Derek S.; Combs, Steven P.; and Brems, John J., 4,294,251, Cl. 128-276.000.

Geiszler, Willard A., Jr.: *See—*
Kassman, Allen J.; and Geiszler, Willard A., Jr., 4,294,265, Cl. 131-366.000.

Gell, Peter L., to Tuscan Industries Pty. Limited. Tape cartridge. 4,294,418, Cl. 242-197.000.

Gendron, Wilfred H., to Westvaco Corporation. Non-gusseted expansible envelope. 4,294,400, Cl. 229-68.00R.

General Atomic Company: *See—*
Graf, Fredy E.; Mahler, William M.; and Malan, Howard J., 4,295,051, Cl. 250-569.000.

General Battery Corporation: *See—*
Eberle, William J., 4,294,292, Cl. 141-1.000.

General Dynamics Corporation: *See—*
Couchman, James C., 4,294,122, Cl. 73-761.000.

General Electric Company: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,294,631, Cl. 148-133.000.
Bair, Eugene C.; and Hopkins, Willard C., 4,294,006, Cl. 29-701.000.
Balko, Edward N., 4,294,671, Cl. 204-128.000.
Carollo, Jerome T.; and Barbarasch, Joseph, 4,295,159, Cl. 358-22.000.
Cordray, Daniel E., 4,295,175, Cl. 361-69.000.
Cutler, John H.; Espelage, Paul M.; and Walker, Loren H., 4,295,086, Cl. 318-759.000.
Erkfritz, Donald S., 4,294,565, Cl. 407-113.000.
Faler, Gary R.; and Loucks, George R., 4,294,995, Cl. 568-728.000.
Frank, James P., 4,294,004, Cl. 29-622.000.
Gamble, Bruce B., 4,295,068, Cl. 310-52.000.
Lafuze, David L., 4,295,085, Cl. 318-721.000.
Laskow, William; and Morelock, Charles R., 4,294,788, Cl. 264-101.000.
Li, Ming K., 4,294,993, Cl. 568-724.000.
Li, Ming K., 4,294,994, Cl. 568-724.000.
Oler, Robert A., 4,294,812, Cl. 423-357.000.
Orlando, Charles M.; and Loucks, George R., 4,294,954, Cl. 528-174.000.
Patenaude, Raymond A.; Cozzy, Thomas W.; and Bullis, Stephen J., 4,294,158, Cl. 89-12.000.
Quinn, Clayton B.; and Hilakos, William, 4,294,953, Cl. 528-128.000.
Sedlak, John M.; and Lawrance, Richard J., 4,294,608, Cl. 75-0.50A.
Steigerwald, Robert L., 4,295,059, Cl. 307-253.000.

General Motors Corporation: *See—*
Atkins, Larry P., 4,294,895, Cl. 429-84.000.
Donley, William B., 4,295,209, Cl. 365-178.000.
Givan, David E.; and Ashton, Charles R., 4,295,069, Cl. 310-67.00R.
Lake, Donald E.; and Hart, John M., Jr., 4,295,117, Cl. 338-4.000.
Wendler, Paul O.; and Welsh, Clarence E., 4,294,159, Cl. 91-375.00A.
Witherspoon, Romeo R., 4,294,899, Cl. 429-206.000.

General Refractories Company: *See—*
Anthonis, Henry E., 4,294,618, Cl. 501-129.000.

General Signal Corporation: *See—*
Heydweiller, James, 4,295,020, Cl. 200-61.45R.

Geng, Hellmuth R.: *See—*
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Genovese, Frank C., to Xerox Corporation. Thermoremanent magnetic imaging member and system. 4,294,901, Cl. 430-39.000.

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DeLuca, Raymond F., 4,294,778, Cl. 261-30.000.

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Pearl, David R., 4,294,047, Cl. 51-327.000.

Gerboth, Patrick L.; and Thompson, Charles W., to SGM Co., Inc. Hydraulic blower system for vehicles. 4,294,082, Cl. 62-244.000.

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Geselischaft zur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Finsterwalder, Lorenz, 4,294,702, Cl. 210-513.000.

Gevaud, Roland; and Tallon, Jacques, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Leak detector. 4,294,106, Cl. 73-40.700.

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Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.

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Giflo, Henrik. Acid resistant, high-strength steel suitable for polishing. 4,294,613, Cl. 75-124.000.

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Lieberman, Gilbert R., 4,294,503, Cl. 339-119.00L.
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Rodenberg, Joseph H.; and Gilcrest, Richard K., 4,294,195, Cl. 119-20.000.
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Gioello, Debbie A. Stretch knit body suit with padded areas. 4,293,959, Cl. 2-243.00B.
Givan, David E.; and Ashton, Charles R., to General Motors Corporation. Armature shaft for a vehicle starter motor. 4,295,069, Cl. 310-67.00R.
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Fry, Timothy S., 4,294,326, Cl. 180-255.000.
GKN-Stenman AB: *See*—
Haggstrom, Ake T. L., 4,294,092, Cl. 70-364.00A.
Glace, William R.: *See*—
Ibsen, Robert L.; and Glace, William R., 4,294,349, Cl. 206-63.500.
Gledhill, Richard J.: *See*—
Aubusson, Russell C.; and Gledhill, Richard J., 4,295,182, Cl. 361-400.000.
Global Marine Inc.: *See*—
Person, Abraham; Wetmore, Sherman B.; and McNary, James F., 4,294,564, Cl. 405-195.000.
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Hans, Waldmar; Sauer, Rudolf; Glockler, Otto; Steinbrenner, Ulrich; Gunther, Dieter; and Lembke, Manfred, 4,294,215, Cl. 123-470.000.
Glymph, Ronald C. Pocket pipe. 4,294,267, Cl. 131-330.000.
GM Research: *See*—
Murez, James D., 4,294,496, Cl. 312-208.000.
Godard, Pierre; and Billot, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Method of controlling the heating of a chamber and a controlled chamber-heating installation. 4,294,309, Cl. 165-18.000.
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Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, 4,294,834, Cl. 424-260.000.
Golay, Marcel J. E. Heat insulator. 4,294,231, Cl. 126-441.000.
Gold, Barry L.; and Bolesky, Richard C., to Zimmer USA, Inc. Unrestrained elbow prosthesis. 4,293,963, Cl. 3-1.910.
Goldwell GmbH: *See*—
Lorenz, Heribert; and Tennigkeit, Jurgen, 4,294,293, Cl. 141-100.000.
Golik, Jerzy: *See*—
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.
Golik, Sergei Y.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.
Gombas, Laszlo A. Bottom roll-forming method and apparatus and resultant can end configuration. 4,294,097, Cl. 72-94.000.
Goodman, Ronald L.: *See*—
Davenport, Robert W.; Moore, Eugene L.; and Goodman, Ronald L., 4,294,042, Cl. 51-54.000.
Goodrich, George W.: *See*—
O'Connor, James M.; and Goodrich, George W., 4,294,518, Cl. 350-357.000.
Goodwin, Robert J.: *See*—
Wetzel, William H.; Pan, Hsi-Lung; Goodwin, Robert J.; and Wilkinson, John E., 4,294,996, Cl. 568-776.000.
Goodyear Aerospace Corporation: *See*—
Uram, John R., Jr., 4,294,886, Cl. 428-412.000.
Goodyear Tire & Rubber Company, The: *See*—
Henderson, James N., 4,294,942, Cl. 525-314.000.
Gordon, Roy G. Apparatus for vapor coating a moving glass substrate. 4,294,193, Cl. 118-718.000.
Gorzegno, Walter P., to Foster Wheeler Energy Corporation. Variable pressure vapor generator utilizing crossover circuitry for the furnace boundary wall fluid flow tubes. 4,294,200, Cl. 122-406.00S.
Gottbreht, Tom L.; and Shepherd, Glen C., to Texas Instruments Incorporated. Method of fabricating capacitive touch switch panel. 4,293,987, Cl. 29-25.420.
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Cassidy, Frederick; and Goudie, Alexander C., 4,294,972, Cl. 548-264.000.
Gould Inc.: *See*—
Robins, Charles T., 4,295,022, Cl. 200-147.00R.
Gowans, Neil A.; and Riester, William C., to Trico Products Corporation. Arm to blade connector. 4,293,974, Cl. 15-250.320.
Graco Inc.: *See*—
Snyder, Irving F.; and Luebeck, Duane A., 4,294,408, Cl. 239-218.500.
Graf, Fredy E.; Mahler, William M.; and Malan, Howard J., to General Atomic Company. Optical card reader. 4,295,051, Cl. 250-569.000.
Graham, Alan A.; Haemer, Laurence F.; and Miller, Charles H., to Congoleum Corporation. Solar heat energy collecting systems and methods of making the same. 4,294,786, Cl. 264-46.400.
Graham, William F., to Du Pont de Nemours, E. I., and Company. Epoxy imide. 4,294,743, Cl. 260-32.8EP.
Graham, William F., to Du Pont de Nemours, E. I., and Company. Epoxy imide compositions. 4,294,877, Cl. 428-209.000.
Grane, Henry R.; Jubin, John C., Jr.; and Worrell, G. Richard, to Atlantic Richfield Company. Preparing oxygen-containing fuel wherein tertiary butyl alcohol is the major product of the process. 4,294,999, Cl. 568-910.000.
Granger, Bruce A.; and Klis, David S., to Toro Company, The. Clutch assembly. 4,294,339, Cl. 192-12.0BA.
Granger, Charles A.: *See*—
Bencene, Robert C.; and Granger, Charles A., 4,293,970, Cl. 15-21.00D.
Granzow, Daniel B.: *See*—
Carter, Garry L.; Granzow, Daniel B.; and Bayham, Edward L., 4,294,247, Cl. 128-214.00D.
Grardel, Jean-Luc: *See*—
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Graubmaier, Josef: *See*—
Aulich, Hubert; and Graubmaier, Josef, 4,294,811, Cl. 423-350.000.
Graves, J. Robert: *See*—
Rutledge, Wyman C.; Graves, J. Robert; and Cassill, William G., 4,294,111, Cl. 73-150.00R.
Gray, Derek C.: *See*—
Jack, James; and Gray, Derek C., 4,294,796, Cl. 264-559.000.
Gray, Robert I.: *See*—
Picunko, Thomas; Kramer, Henry H.; Dam, Naim G.; and Gray, Robert I., 4,294,259, Cl. 128-653.000.
Graziano, Robert E.: *See*—
Dawless, Robert K.; and Graziano, Robert E., 4,294,612, Cl. 75-68.00R.
Great Lakes Carbon Corporation: *See*—
Burton, Edward D., 4,294,610, Cl. 75-43.000.
Greatbatch, Wilson. Rate controlled digital pacemaker. 4,294,256, Cl. 128-419.0PT.
Grechko, Alexandr V.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.
Greenlee Bros. & Co.: *See*—
Kolnes, Kenneth O.; and Johnson, Wynsel J., 4,294,442, Cl. 269-101.000.
Greenwald, A. Seth; Geiger, Jack M.; Narten, Nathaniel C.; Porritt, Derek S.; Combs, Steven P.; and Brems, John J. Method of suction lavage. 4,294,251, Cl. 128-276.000.
Greppmair, Martin; and Grunwald, Wittloff, to Wacker Werke GmbH & Co. KG. Crank gear with adjustable crank radius for motor driven working implements. 4,294,136, Cl. 74-600.000.
Grin-Gnatovsky, Evgeny S.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.
Grogler, Gerhard; Schwindt, Jurgen; Ganster, Otto; Meiners, Hans-Joachim; and Ruprecht, Hans-Dieter, to Bayer Aktiengesellschaft. Process for the production of elastic, optionally cellular, polyurethane ureas. 4,294,934, Cl. 521-160.000.
Grolet, Pierre: *See*—
Desbrandes, Robert; and Grolet, Pierre, 4,294,318, Cl. 175-321.000.
Grossag GmbH: *See*—
Assmann, Jurgen, 4,295,034, Cl. 219-400.000.
Grossin, Richard J. A. M.: *See*—
Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., 4,294,232, Cl. 126-443.000.
Grossmann, Klaus: *See*—
Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, 4,294,126, Cl. 73-864.210.
Grossoleil, Jacques: *See*—
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,294,704, Cl. 210-651.000.
Grove, Louis C., Jr.: *See*—
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Grovesteen, William R.; and Jones, John A., to American Optical Corporation. Aerosol filter cartridge. 4,294,599, Cl. 55-485.000.
Grunwald, Wittloff: *See*—
Greppmair, Martin; and Grunwald, Wittloff, 4,294,136, Cl. 74-600.000.

Gruter, Karl; and Leineweber, Jurgen, to Leybold Heraeus GmbH. Mass spectrometer. 4,295,046, Cl. 250-287.000.

GTE Automatic Electric Laboratories, Inc.: *See—*
Ellis, Paul R., Jr., 4,294,007, Cl. 29-830.000.

GTE Laboratories Incorporated: *See—*
Carlsen, W. John, 4,295,162, Cl. 358-128.600.
Cooperman, Michael, 4,295,089, Cl. 323-351.000.
Haugsjaa, Paul O., 4,295,137, Cl. 340-781.000.
Norbedo, Robert A.; and Resnick, Martin L., 4,295,208, Cl. 364-900.000.
Resnick, Martin L., 4,295,207, Cl. 364-900.000.

GTE Products Corporation: *See—*
Burney, Charles F.; and Laymon, Marvin D., 4,295,132, Cl. 340-562.000.
Kim, Han J.; Peters, Thomas E.; and Gustafson, John, 4,294,616, Cl. 75-234.000.
Lincoln, Howard P.; and Reddinger, Donald M., 4,294,669, Cl. 204-15.000.
Lincoln, Howard P.; and Reddinger, Donald M., 4,294,680, Cl. 204-224.00R.
Lincoln, Howard P.; and Reddinger, Donald M., 4,294,681, Cl. 204-224.00R.
Lincoln, Howard P.; and Reddinger, Donald M., 4,294,789, Cl. 264-102.000.
Webb, Edward A.; McKenna, John F.; and Makar, Frank B., Jr., 4,295,075, Cl. 313-220.000.

Guenot, Bernard: *See—*
Boutin, Jean; Guenot, Bernard; and Jamet, Bruno, 4,294,676, Cl. 204-159.230.

Gueret, Jean-Louis, to L'Oreal. Closing device, with a tiltable nozzle, for a pressurized container. 4,294,410, Cl. 239-577.000.

Guergen, Karlheinz. Cutter head for rotary percussion drills. 4,294,319, Cl. 175-389.000.

Guerra, Salvatore: *See—*
Meyer, John H.; and Guerra, Salvatore, 4,294,881, Cl. 428-334.000.

Guignard, Paul; and Commeau, Alain, to Framatome. Process for the final assembly of a nuclear reactor vessel. 4,294,662, Cl. 219-61.000.

Guild, John R., to Eastman Kodak Company. Development of light-sensitive quinone diazide compositions using sulfite stabilizer. 4,294,911, Cl. 430-326.000.

Guiliano, Basil A.: *See—*
Bagnall, Elizabeth A.; Guiliano, Basil A.; and Pfeffer, Henry A., III, 4,294,962, Cl. 544-192.000.

Gulf Canada Limited: *See—*
Fisher, Ian P.; Woods, H. John; and Souhrada, Frank, 4,294,686, Cl. 208-56.000.

Gunther, Dieter: *See—*
Hans, Waldmar; Sauer, Rudolf; Glockler, Otto; Steinbrenner, Ulrich; Gunther, Dieter; and Lembke, Manfred, 4,294,215, Cl. 123-470.000.

Gustafson, John: *See—*
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Gutberlet, L. Charles: *See—*
Kim, Dae K.; Bertolacini, Ralph J.; Gutberlet, L. Charles; and Robinson, Ken K., 4,294,685, Cl. 208-10.000.

Gyogyszerkutato Intezet: *See—*
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.

H. F. & Ph. F. Reemtsma: *See—*
Wilfer, Oskar, 4,294,399, Cl. 229-44.0CB.

Haase, Margaret J.; Hasse, Meredith; and Halle, Joan. Shower party name plate and favor. 4,294,350, Cl. 206-216.000.

Hachino, Hiroaki: *See—*
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Hack, Oswald: *See—*
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Haemer, Laurence F.: *See—*
Graham, Alan A.; Haemer, Laurence F.; and Miller, Charles H., 4,294,786, Cl. 264-46.400.

Haeussinger, Peter: *See—*
Linde, Gerhard; Haeussinger, Peter; and Schliebener, Claus, 4,294,590, Cl. 55-48.000.

Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, to Kureha Kagaku Kogyo Kabushiki Kaisha; and NGK Insulators, Ltd. Stabilized electrocast zirconia refractories. 4,294,795, Cl. 264-332.000.

Haggstrom, Ake T. L., to GKN-Stenman AB. Cylinder lock having spring-actuated pins. 4,294,092, Cl. 70-364.00A.

Hagyu, Toshimasa: *See—*
Obata, Toshiharu; Hagyu, Toshimasa; and Kojima, Hisao, 4,294,396, Cl. 228-245.000.

Haji, Katsumi: *See—*
Hata, Hidetoh; Haji, Katsumi; Sako, Kazushige; Shibata, Yoji; and Achiha, Masahiko, 4,295,154, Cl. 358-4.000.

Hajime Industries Ltd.: *See—*
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Hall, John B.: *See—*
Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., 4,294,266, Cl. 131-277.000.

Hall, John W.: *See—*
Moore, Ronald D.; and Hall, John W., 4,294,112, Cl. 73-162.000.

Hallberg, Lars O.: *See—*
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Halle, Joan: *See—*
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Hallett, Robert J.: *See—*
Fennel, John W., Jr.; Hallett, Robert J.; Head, Stanley M.; and Melas, Constantine M., 4,295,217, Cl. 370-81.000.

Halvorsen, Jack R.: *See—*
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Hammer, Josef: *See—*
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Hammersand, Fred G.: *See—*
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Hampton, Vernon: *See—*
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Hanamura, Syoji: *See—*
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Hannes Marker: *See—*
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Hans, Waldmar; Sauer, Rudolf; Glockler, Otto; Steinbrenner, Ulrich; Gunther, Dieter; and Lembke, Manfred, to Robert Bosch GmbH. Fuel injection system. 4,294,215, Cl. 123-470.000.

Hansen, John M., to Emerson Electric Co. Tracking mechanism for a belt type sander. 4,294,044, Cl. 51-135.0BT.

Hara, Haruichi; Kanzaki, Toshihide; Motomuro, Hisanao; and Adachi, Akiyoshi, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Heat resistant catalyst for the production of sulfuric acid for using a gas containing sulfur dioxide in a high concentration. 4,294,723, Cl. 252-440.000.

Hara, Reinosuke: *See—*
Otsuka, Chikao; Hara, Reinosuke; and Shigenaka, Yoshito, 4,294,367, Cl. 215-246.000.

Hara, Yukio: *See—*
Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; Fujii, Hiroyuki; and Kabushiki Kaisha Seikosha, 4,293,986, Cl. 29-25.350.

Harada, Hideo: *See—*
Nishimura, Yoshinori; Umeda, Kaoru; and Harada, Hideo, 4,295,224, Cl. 455-156.000.

Harada, Kunihiro: *See—*
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Harada, Yoshiaki: *See—*
Kakihara, Naomichi; Harada, Yoshiaki; and Uedono, Norio, 4,294,706, Cl. 210-762.000.

Hardy, Frederick E.; and Dewar, Colin A., to Procter & Gamble Company, The. Detergent softener with amine ingredient. 4,294,710, Cl. 252-8.800.

Hardy, Frederick E.; and Stoddart, Barry, to Procter & Gamble Company, The. Washing and softening compositions and methods for their manufacture. 4,294,711, Cl. 252-8.750.

Hardy, Nicolas; and Dancot, Georges, to Propylox (Societe Anonyme). Process for the purification of organic solutions of percarboxylic acids. 4,294,776, Cl. 260-502.00R.

Harigane, Kotaro: *See—*
Takahashi, Tetsuo; Taguchi, Yoshinobu; Harigane, Kotaro; Ito, Tetsuro; and Kato, Akihiro, 4,294,000, Cl. 29-564.600.

Harita, Yoshiyuki; Kamoshida, Yoichi; and Harada, Kunihiro, to Japan Synthetic Rubber Co., Ltd. Photoresist composition containing modified cyclized diene polymers. 4,294,908, Cl. 430-286.000.

Harjar, Martin J.: *See—*
Hastings, Donald R.; and Harjar, Martin J., 4,294,411, Cl. 239-707.000.

Harkleroad, James F. Mortar/concrete hand-mixing tub. 4,294,547, Cl. 366-1.000.

Harm, Josephus J. D. Prefabricated chimney-shaft. 4,294,474, Cl. 285-133.00R.

Harper, Norman J.: *See—*
Jones, William A.; Hing Yuen, Tse Lin Sin Tse; Rytomaa, Tapio; Harper, Norman J.; and Frost, Henry F., 4,294,824, Cl. 424-101.000.

Harris Corporation: *See—*
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Harris, George S., to Syntex (U.S.A.) Inc. Use of 4,5-dihydro-2-lower alkoxycarbonylamino-4-phenyl imidazoles and substituted phenyl derivatives thereof as anti-hypertensive agents. 4,294,844, Cl. 424-273.00R.

Harris, John F., Jr., to Du Pont de Nemours, E. I., and Company. Polymers from phenylterephthalic acid. 4,294,955, Cl. 528-176.000.

Harrison, John M.: *See—*
Johnson, Avery R.; McGurk, Richard G.; and Harrison, John M., 4,295,008, Cl. 179-18.0BC.

Harrison, Loren C. Water sensitive probe valve for use with a gas leak detector. 4,294,276, Cl. 137-67.000.

Harsy, Gabor, to Sig Schweizerische Industrie-Gesellschaft. Swivel-truck spring system for railroad use. 4,294,175, Cl. 105-199.00R.

Hart, John M., Jr.: *See—*
Lake, Donald E.; and Hart, John M., Jr., 4,295,117, Cl. 338-4.000.

Harte, Richard A.: *See*—
Burgett, Michael W.; and Harte, Richard A., 4,294,817, Cl. 424-8.000.
Hartenstein, Johannes; Satzinger, Gerhard; Bahrmann, Heinrich; and Ganser, Volker, to Godecke Aktiengesellschaft. Azocine analgesics and method for their preparation. 4,294,834, Cl. 424-260.000.
Hartley, Henry F.: *See*—
Darden, Boyd E.; and Hartley, Henry F., 4,295,194, Cl. 364-200.000.
Hartmann, Juergen; Stedefeder, Joachim; Denzinger, Walter; and Pfohl, Sigberg, to BASF Aktiengesellschaft. Manufacture of paper having a high dry strength and a low wet strength. 4,294,873, Cl. 427-391.000.
Hartmann, Willy: *See*—
Scholz, Karl-Heinz; Hartmann, Willy; and Heine, Hans-Georg, 4,294,973, Cl. 548-320.000.
Hartstein, Allan M., to International Business Machines Corporation. Solid state battery. 4,294,898, Cl. 429-104.000.
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Hayes, Richard H., to Eagle-Picher Industries, Inc. Apparatus for cutting sheet molding compound. 4,294,144, Cl. 83-71.000.
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Heimann, Joseph B. Method and apparatus for making a secondary key for a lock mechanism. 4,294,096, Cl. 72-60.000.
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Idelson, Elbert M., to Polaroid Corporation. Silver halide developing agents. 4,294,915, Cl. 430-441.000.
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Ifuku, Yasushi; Uchiyama, Hirofumi; and Hayashi, Masayuki, to Mitsubishi Jukogyo Kabushiki Kaisha; and Prefectural Economic Federation of Agricultural Co-operatives. Method of separating and taking out pulp from citrus fruits. 4,294,861, Cl. 426-475.000.
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Ihara, Hirokazu: *See*—
Hatada, Minoru; Hiyama, Kunio; Ihara, Hirokazu; and Kuma, Hisao, 4,295,122, Cl. 340-147.0LP.
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Kodera, Yuji; Ikari, Kyoichiro; and Miyake, Shunji, 4,294,935, Cl. 525-60.000.
Ikeda, Takashi: *See*—
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Ikemura, Yuichi: *See*—
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Iki, Tetsuo: *See*—
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Illinois Tool Works Inc.: *See*—
Borja, Jesus; and Halvorsen, Jack R., 4,295,003, Cl. 174-53.000.
Keeler, Robert J.; and Filipiak, Stanley E., 4,295,012, Cl. 200-5.00B.
Imperial Chemical Industries, Inc.: *See*—
Snowden, Paul, 4,294,783, Cl. 264-8.000.
Imperial Chemical Industries Limited: *See*—
Anderson, Norman; Peak, Richard; and Moyse, James A., 4,294,709, Cl. 252-8.800.
Bentley, John; and Thompson, Morice, 4,294,735, Cl. 260-22.0CB.
Nicks, Peter F., 4,294,887, Cl. 428-423.100.
Inami, Yasuhiko: *See*—
Nakauchi, Hiroshi; Koyanagi, Katubumi; Inami, Yasuhiko; and Uede, Hisashi, 4,295,138, Cl. 340-785.000.
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Baldwin, Stanley L.; Hampton, Vernon; and Embleton, Tony F. W., 4,294,330, Cl. 181-230.000.
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Treible, Edwin S.; Dopkin, Joseph A.; and Alford, Raymond N., 4,294,214, Cl. 123-458.000.
Ingram, Arlen E. Tennis ball holder. 4,294,386, Cl. 224-252.000.
Innocenti, Franco; Orzalesi, Giovanni; and Volpato, Ivo, to Societa Italo-Britannica. Substituted 4-hydroxy-isophthalic acid picolylamides having a pharmaceutical activity in thromboembolic disorders. 4,294,833, Cl. 424-263.000.
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Inoue, Kiyoshi, 4,294,121, Cl. 73-662.000.
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Inouye, Hiroshi; and Sato, Eiichi, to Hitachi, Ltd. Mechanical seal. 4,294,453, Cl. 277-22.000.
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Britton, Kenneth L., 4,295,001, Cl. 13-17.000.
Institut Francais du Petrole: *See*—
Cholet, Jacques; Magneville, Pierre; and Cassand, Jean, 4,294,328, Cl. 181-120.000.
Cohen, Georges; and Rojey, Alexandre, 4,294,080, Cl. 62-101.000.
Desbrandes, Robert; and Grolet, Pierre, 4,294,318, Cl. 175-321.000.
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Eschinasi, Emile H.; and Castelli, Enrico, 4,294,767, Cl. 260-347.800.
Integrated Energy Systems: *See*—
Gajjar, Jagdishchandra T., 4,294,404, Cl. 236-49.000.
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Bakos, Peter; Darrow, Russell E.; Funari, Joseph; and Poliak, Richard M., 4,294,729, Cl. 252-545.000.
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.
Beranger, Herve; Marzin, Claude; Omet, Dominique; and Peter, Jean-Luc, 4,295,210, Cl. 365-227.000.
Blum, Arnold; Geng, Hellmuth R.; Schulze-Schoelling, Hermann; and Spaeth, Bernd, 4,295,220, Cl. 371-61.000.
Chappell, Terry I., 4,294,510, Cl. 350-96.170.
Chappell, Terry I.; and Woodall, Jerry M., 4,295,002, Cl. 136-244.000.
Enser, Mats A.; Hallberg, Lars O.; and Stalberg, Nils G., 4,295,121, Cl. 340-146.3MA.
Fennel, John W., Jr.; Hallett, Robert J.; Head, Stanley M.; and Melas, Constantine M., 4,295,217, Cl. 370-81.000.
Hartstein, Allan M., 4,294,898, Cl. 429-104.000.
Jambotkar, Chakrapani G.; and Wang, Paul P., 4,294,002, Cl. 29-571.000.
Johnson, Mark, 4,294,507, Cl. 350-96.130.
Kircher, Charles J.; Huang, Hung-Chang W.; and Murakami, Masanori, 4,295,147, Cl. 357-5.000.
Langdon, Glen G., Jr., 4,295,125, Cl. 340-347.0DD.
Latta, Milton R., 4,295,145, Cl. 346-108.000.
Mako, John, 4,294,552, Cl. 400-219.100.

Miersch, Ekkehard F.; and Romankiw, Lubomyr T., 4,295,183, Cl. 361-403.000.
Pomerene, James H., 4,295,193, Cl. 364-200.000.
Romankiw, Lubomyr T.; and Thompson, David A., 4,295,173, Cl. 360-125.000.
Schuster, Stanley E., 4,295,064, Cl. 307-468.000.
Stuckert, Paul E., 4,295,039, Cl. 235-380.000.

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Burgett, Michael W.; and Harte, Richard A., 4,294,817, Cl. 424-8.000.

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Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; and Vock, Manfred H., 4,294,863, Cl. 426-538.000.
Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., 4,294,266, Cl. 131-277.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,294,708, Cl. 252-8.600.

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Turner, Rex H., 4,294,654, Cl. 162-50.000.

International Standard Electric Corporation: *See*—
Galaske, Folker; and Hack, Oswald, 4,294,555, Cl. 400-488.000.

International Telephone and Telegraph Corporation: *See*—
Jarger, Harold F.; and Sassler, Marvin L., 4,295,155, Cl. 358-12.000.

Intrater, Janet: *See*—
Intrater, Josef; Bertholdo, Gene; and Intrater, Janet, 4,294,271, Cl. 134-113.000.

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Inubushi, Hisao: *See*—
Sawada, Hajimu; and Inubushi, Hisao, 4,294,437, Cl. 266-272.000.

Irako, Koichi: *See*—
Ohyachi, Tomio; and Irako, Koichi, 4,294,732, Cl. 260-27.0BB.

IRD Mechanalysis, Inc.: *See*—
Stoutenburg, Donn V., 4,295,136, Cl. 340-753.000.

Isberg, Gary J. Fluid proportioning device. 4,294,273, Cl. 137-1.000.

Ise, Yukihiko: *See*—
Fukada, Tetsuji; and Ise, Yukihiko, 4,295,172, Cl. 360-109.000.

Iseki, Shigeo: *See*—
Kinumaki, Toyosuke; Watanabe, Takehiko; Sugii, Kisaburo; and Iseki, Shigeo, 4,294,856, Cl. 426-7.000.

Ishibashi, Toshiaki: *See*—
Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, 4,294,933, Cl. 521-27.000.

Ishida, Eisuke: *See*—
Takashima, Yuji; Ishida, Eisuke; Nishiguchi, Hisanori; and Yoshino, Kimiaki, 4,294,902, Cl. 430-45.000.

Ishigaki, Kunio: *See*—
Yamaguchi, Jun; Naoi, Takashi; Sera, Hidefumi; Ishigaki, Kunio; and Ogawa, Masasi, 4,294,921, Cl. 430-621.000.

Ishii, Keizou: *See*—
Mizuguchi, Ryuzo; Ishikura, Sinichi; Ishii, Keizou; and Yoshioka, Tamotu, 4,294,740, Cl. 260-29.6RB.

Ishikawa, Kazuo: *See*—
Sato, Yasuhisa; Tsuji, Sadahiko; and Ishikawa, Kazuo, 4,294,529, Cl. 354-53.000.

Ishikura, Sinichi: *See*—
Mizuguchi, Ryuzo; Ishikura, Sinichi; Ishii, Keizou; and Yoshioka, Tamotu, 4,294,740, Cl. 260-29.6RB.

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Kumazawa, Eitaro; Saiki, Yukihiro; and Ishioka, Yozo, 4,294,018, Cl. 34-56.000.

Issei, Katsuta; and Tetsuo, Tanaka, to Asahi Kasei Kogyo Kabushiki Kaisha. Separation of acetonitrile from crude olefinically unsaturated nitrile. 4,294,665, Cl. 203-50.000.

Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, to UBE Industries, Ltd. Process for producing biphenyl compounds. 4,294,976, Cl. 560-76.000.

Ito Optical Industrial Co., Ltd.: *See*—
Kato, Hirohisa, 4,294,950, Cl. 528-14.000.

Ito, Seigo: *See*—
Moto, Masato; and Ito, Seigo, 4,295,082, Cl. 318-599.000.

Ito, Susumu; Sugawara, Noboru; and Amano, Sayoko, to Canon Kabushiki Kaisha. Method for preventing reflection. 4,294,890, Cl. 428-641.000.

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Takahashi, Tetsuo; Taguchi, Yoshinobu; Harigane, Kotaro; Ito, Tetsuro; and Kato, Akihiro, 4,294,000, Cl. 29-564.600.

Itoh, Junichi: *See*—
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,294,943, Cl. 525-358.000.

ITT Industries, Inc.: *See*—
Adam, Fritz G., 4,295,150, Cl. 357-54.000.
Holzmann, Dieter; and Schmidtpott, Friedrich, 4,295,126, Cl. 340-347.0DD.

Ivanov, Vladimir V.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Iwaki, Yoshiyuki: *See*—
Morishita, Mitsuharu; and Iwaki, Yoshiyuki, 4,295,087, Cl. 322-99.000.

Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Hydraulic torque converter control system. 4,294,140, Cl. 74-868.000.

Iwasa, Tomoyuki: *See*—
Iwata, Mitsuo; Wada, Hajime; Iwasa, Tomoyuki; and Tsuchino, Kunio, 4,295,169, Cl. 360-71.000.

Iwashita, Tomonori; Fukahori, Hidehiko; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Motorized photographic system and camera and power drive unit therefor. 4,294,530, Cl. 354-173.000.

Iwata, Mitsuo; Wada, Hajime; Iwasa, Tomoyuki; and Tsuchino, Kunio, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Cassette loading and unloading device. 4,295,169, Cl. 360-71.000.

Izawa, Ryuichi: *See*—
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.

Izumi, Hideki: *See*—
Yoshioka, Masahiro; Koike, Toshifumi; and Izumi, Hideki, 4,294,494, Cl. 308-76.000.

J. J. Barker Company Limited: *See*—
Turnbull, James O.; Barker, John C.; and Knight, Arthur J., 4,294,021, Cl. 34-224.000.

Jack, James; and Gray, Derek C., to BXL Plastics Limited. Extrusion processes and apparatus for quenching tubes. 4,294,796, Cl. 264-559.000.

Jackson, Kenneth W.: *See*—
Daugherty, Edgar E.; Jackson, Kenneth W.; Jones, Wesley W.; and Subh, Naif T., 4,295,005, Cl. 174-92.000.

Jacobs, John T. Vision therapeutic apparatus. 4,294,522, Cl. 351-2.000.

Jaeschke, James R.: *See*—
Lade, Robert W.; Spellman, Gordon B.; Jaskolski, Stanley V.; Schutten, Herman P.; and Jaeschke, James R., 4,295,058, Cl. 307-252.00A.

Jagenberg Werke AG: *See*—
Bodewein, Jakob, 4,294,145, Cl. 83-302.000.

Jakubek, John, to Timex Corporation. Electrooptical device with encapsulated self-luminous backlight assembly. 4,294,517, Cl. 350-345.000.

Jallas, Michel: *See*—
Piret, Jean; and Jallas, Michel, 4,294,137, Cl. 74-665.00G.

Jambotkar, Chakrapani G.; and Wang, Paul P., to International Business Machines Corp. Making a short-channel FET. 4,294,002, Cl. 29-571.000.

Jamet, Bruno: *See*—
Boutin, Jean; Guenot, Bernard; and Jamet, Bruno, 4,294,676, Cl. 204-159.230.

Janisch, Paul: *See*—
Lohrberg, Karl; Bielz, Siegfried; and Janisch, Paul, 4,294,815, Cl. 423-478.000.

Janko, Mike A.: *See*—
Weiszbrod, David A., 4,295,170, Cl. 360-73.000.

Japan Atomic Energy Research Institute: *See*—
Matsuda, Osamu; Watanabe, Terutaka; Tabata, Yoneho; and Machi, Sueo, 4,294,675, Cl. 204-159.140.
Minami, Kentaro, 4,295,045, Cl. 250-255.000.

Japan Envirotic Industry Co., Ltd.: *See*—
Kirisawa, Atsushi, 4,294,626, Cl. 148-6.200.

Japan Synthetic Rubber Co., Ltd.: *See*—
Harita, Yoshiyuki; Kamoshida, Yoichi; and Harada, Kunihiro, 4,294,908, Cl. 430-286.000.

Jarger, Harold F.; and Sassler, Marvin L., to International Telephone and Telegraph Corporation. Gray scale sync video processing system. 4,295,155, Cl. 358-12.000.

Jarzebski, Andrzej: *See*—
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

Jaskolski, Stanley V.: *See*—
Lade, Robert W.; Spellman, Gordon B.; Jaskolski, Stanley V.; Schutten, Herman P.; and Jaeschke, James R., 4,295,058, Cl. 307-252.00A.

Jean Walterscheid GmbH: *See*—
Kunze, Dieter, 4,294,340, Cl. 192-56.00R.

Jedeck, Helmar: *See*—
Jochmann, Franz; and Jedeck, Helmar, 4,295,052, Cl. 307-10.00R.

Jen, Teh-Sen: *See*—
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.

Jensen, Kenneth D., to Midland-Ross Corporation. Hydraulic booster travel ratio check valve. 4,294,071, Cl. 60-547.00A.

Jewusiak, Stephen J.; Beroff, Howard; and Schuler, Michael, to Ethicon, Inc. Cartridge for hemostatic clips. 4,294,355, Cl. 206-339.000.

Jochmann, Franz; and Jedeck, Helmar, to Bayerische Motoren Werke Aktiengesellschaft. Circuit for motor vehicles. 4,295,052, Cl. 307-10.00R.

Johansson, Henry. Apparatus for parallel feeding of small volumes of fluids in several essentially parallel flexible hoses. 4,294,802, Cl. 422-103.000.

Johansson, Sven H., to Aktiebolaget Svenska Elektromagneter. Means for providing a mechanically definable selected trigger interval in a flywheel magneto. 4,295,070, Cl. 310-70.00R.

Johns-Manville Corporation: *See*—
Cunningham, Richard N.; and Loeffler, Romain E., deceased, 4,294,878, Cl. 428-212.000.
Davenport, Robert W.; Moore, Eugene L.; and Goodman, Ronald L., 4,294,042, Cl. 51-54.000.
McHenry, Patricia A., 4,294,879, Cl. 428-288.000.

Johnson, Avery R.; McGurk, Richard G.; and Harrison, John M., to Small World Exchange, Inc. Telephone-conferencing apparatus and method having response tallying. 4,295,008, Cl. 179-18.0BC.

Johnson & Johnson: *See*—
Wildnauer, Richard H.; and Humphries, William T., 4,294,852, Cl. 424-317.000.

Johnson, Leighton C., to Miles Laboratories, Inc. Method for producing monocellular layers of cell-containing biological fluid. 4,294,866, Cl. 427-2.000.

Johnson, Mark, to International Business Machines Corporation. Controllably deformed elastic waveguide elements. 4,294,507, Cl. 350-96.130.

Johnson, Richard F., to United States of America, Navy. Automatic particle analyzing system. 4,295,200, Cl. 364-555.000.

Johnson, Wynsel J.: *See*—
Kolnes, Kenneth O.; and Johnson, Wynsel J., 4,294,442, Cl. 269-101.000.

Jones, John A.: *See*—
Grovesteen, William R.; and Jones, John A., 4,294,599, Cl. 55-485.000.

Jones, Philip E., to Cummins Engine Company, Inc. Internal combustion engine with integral upper cylinder section and head. 4,294,203, Cl. 123-195.00R.

Jones, Wesley W.: *See*—
Daugherty, Edgar E.; Jackson, Kenneth W.; Jones, Wesley W.; and Subh, Naif T., 4,295,005, Cl. 174-92.000.

Jones, William A.; Hing Yuen, Tse Lin Sin Tse; Rytomaa, Tapio; Harper, Norman J.; and Frost, Henry F., to Union International Company, Ltd., The. Extracts of the hemopoietic system. 4,294,824, Cl. 424-101.000.

Jordan, Friedrich, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method of making camshaft for reciprocable piston engines. 4,293,995, Cl. 29-421.00R.

Jordan, Tony W. J.: *See*—
Hodgson, Thomas D.; and Jordan, Tony W. J., 4,294,805, Cl. 423-4.000.

Jordi, Peter E.: *See*—
Buser, Hansueli; and Jordi, Peter E., 4,294,117, Cl. 73-864.850.

Joshua, Henry: *See*—
Albers-Schonberg, George; Joshua, Henry; and Lopez, Maria B., 4,294,846, Cl. 424-279.000.

Joslyn, Larry J. Multi-port valve. 4,294,285, Cl. 137-625.110.

Jouret, Edouard, to Crouzet. Plug member for the electrical connection of an appliance to a base. 4,294,501, Cl. 339-66.00M.

Joyce, Thomas F., to Honeywell Information Systems Inc. Automatic rounding of floating point operands. 4,295,203, Cl. 364-748.000.

Joyce, Thomas J.; and Cushing, David E., to Honeywell Information Systems Inc. Hexadecimal digit shifter output control by a programmable read only memory. 4,295,202, Cl. 364-748.000.

Jubin, John C., Jr.: *See*—
Grane, Henry R.; Jubin, John C., Jr.; and Worrell, G. Richard, 4,294,999, Cl. 568-910.000.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,294,499, Cl. 312-334.000.

Junot, Henri D. M.: *See*—
Boy-Marcotte, Jean-Louis; Junot, Henri D. M.; Grossin, Richard J. A. M.; and Chevalier, Philippe J. M. R., 4,294,232, Cl. 126-443.000.

Kabushiki Kaisha Fuji Seisakusho: *See*—
Saito, Tsutomu; and Shida, Masaaki, 4,294,657, Cl. 162-303.000.

Kabushiki Kaisha Medos Kenkyusho: *See*—
Takahashi, Nagashige, 4,294,233, Cl. 128-4.000.

Kabushiki Kaisha Seikosha: *See*—
Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; Fujii, Hiroyuki; and Kabushiki Kaisha Seikosha, 4,293,986, Cl. 29-25.350.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Shinoda, Akibumi; and Nakane, Masao, 4,294,334, Cl. 188-18.00A.
Takahisa, Shuji; Suzuki, Osamu; and Shibano, Michio, 4,294,067, Cl. 57-274.000.

Kaeser, James A., to Colgate-Palmolive Company. Non-gelling inorganic salt crutcher slurries. 4,294,718, Cl. 252-135.000.

Kahl, Melvin R., to Envirotech Corporation. Mounting for high-voltage electrode support frame in an electrostatic precipitator. 4,294,591, Cl. 55-120.000.

Kahn, Leonard. Method and means for introducing additional asymmetry into audio waves. 4,295,106, Cl. 332-37.00R.

Kaido, Chikara: *See*—
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.

Kainosho, Masatsune: *See*—
Takahara, Yoshiyuki; Hirose, Yoshiteru; Takeuchi, Yoko; Murai, Asao; Kainosho, Masatsune; and Murao, Sawao, 4,294,754, Cl. 260-112.50R.

Kajiwara, Toshiyuki: *See*—
Iida, Yoshihiko; and Kajiwara, Toshiyuki, 4,294,394, Cl. 228-158.000.

Kakihara, Naomichi; Harada, Yoshiaki; and Uedono, Norio, to Osaka Gas Company, Limited. Process for treating waste water. 4,294,706, Cl. 210-762.000.

Kalasz, Huba: *See*—
Knoll, Jozsef; Kalasz, Huba; Knoll, Berta; and Nagy, Janos, 4,294,825, Cl. 424-101.000.

Kalbskopf, Reinhard; and Baumberger, Otto, to Societa Italiana Vetro-Siv-S.p.A. Process for continuously depositing a layer of a solid material on the surface of a substrate heated to a high temperature. 4,294,868, Cl. 427-109.000.

Kaldor, Antal: *See*—
Tamas, Istvan; Tamas, Lajos; Kiss, Gyula; Kiss, Jozsef; and Kaldor, Antal, 4,294,611, Cl. 75-49.000.

Kaltenbach & Voight GmbH & Co.: *See*—
Eibofner, Eugen, 4,294,797, Cl. 422-36.000.

Kalwaitis, George V., to Air Products and Chemicals, Inc. Apparatus for extraction of materials from operating pressurized vessels. 4,294,124, Cl. 73-863.850.

Kamada, Hiroshi: *See*—
Kimoto, Yasuo; Tamiya, Katsunori; Honda, Shoichi; Maehata, Hidehiko; and Kamada, Hiroshi, 4,294,673, Cl. 204-129.460.

Kamoshida, Yoichi: *See*—
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Kamp, Eugene L., to A. B. Chance Company. Spring biased energy absorber for vacuum switch contact shafts. 4,295,024, Cl. 200-288.000.

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Watanabe, Teruoki; Kanno, Tadao; Hidaka, Akio; and Kobayashi, Shunji, 4,294,630, Cl. 148-16.600.

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Katayama, Tsutomu: *See*—
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Kato, Akihiro: *See*—
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Margulies, Herman; and Kaufman, Richard H., 4,294,361, Cl. 206-532.000.
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Oda, Kenichi, 4,294,305, Cl. 164-150.000.
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Kehrer, Wolfgang; and Lachmann, Helmut, to Borsig GmbH. Tube-bundle heat exchanger for cooling a medium having a high inlet temperature. 4,294,312, Cl. 165-134.00R.
Keith, Alec D.; and Snipes, Wallace, to Key Pharmaceuticals, Inc. Polymeric diffusion matrix containing phenylephrine. 4,294,820, Cl. 424-28.000.
Keller, Alois, to Gebrueder Buehler AG. Drum-type screening machine and method of operation. 4,294,692, Cl. 209-300.000.
Keller, Andre, to Roll & Go AG. Sole attachment for facilitating walking. 4,294,025, Cl. 36-132.000.
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Smith, Clay D.; and Keller, Douglas V., Jr., 4,294,695, Cl. 210-173.000.
Keller, Russell D. Fuel tank cap. 4,294,376, Cl. 220-318.000.
Kelly, Arnold J., to Exxon Research & Engineering Co. Mass sensing element. 4,294,105, Cl. 73-28.000.
Kemme, Wendell J., to T/Drill, Inc. Tube cutter. 4,294,011, Cl. 30-106.000.
Kende, Andrew S.; Curran, Dennis P.; King, Margaret L.; and Feldstein, Neil A., to University of Rochester. Intermediates for the production of picropodophyllin and related compounds and processes for the preparation and use thereof. 4,294,763, Cl. 260-340.5DP.
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Stevens, John H.; and Reidel, Bruce A., 4,294,357, Cl. 206-409.000.
Kenney, Michael J., to Dunlop Limited. Gelled lubricant composition for run-flat tires comprising polybutene acrylic or polyolefin gelling agent and particulate solid puncture sealing material. 4,294,730, Cl. 260-17.4BB.
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Kerlin, Thomas W.: *See—*
Hashemian, Hashem M.; Kerlin, Thomas W.; and Upadhyaya, Belle R., 4,295,128, Cl. 340-506.000.
Kern, Heinz: *See—*
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Kernforschungszentrum Karlsruhe GmbH: *See—*
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Key Pharmaceuticals, Inc.: *See—*
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Schmitz, Gunther; and Kierdorf, Hans, 4,294,064, Cl. 57-3.000.
Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, to Mitsubishi Petrochemical Company Limited. Process for the production of an ion exchange membrane. 4,294,933, Cl. 521-27.000.
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Cowans, Kenneth W., 4,294,242, Cl. 128-201.130.
King, Barton. Air conditioning system. 4,294,083, Cl. 62-434.000.
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Kirsch, Bernhard. Foot-plates for ski-bindings. 4,294,460, Cl. 280-607.000.
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Kishi, Akira: *See—*
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Kitai, Kiyoshi; Ogihara, Masuo; and Chimura, Kozo, to Seiko Koki Kabushiki Kaisha. Second hand correction device for use in timepieces. 4,295,215, Cl. 368-196.000.
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Klaiber, William C. Apparatus for washing, rinsing and spin drying paint rollers. 4,294,272, Cl. 134-138.000.
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Klingaman, Richard M.; and Ehrenreich, Leo C., to Penn Virginia Corporation. Pyroplastoid particles, composition and method of production. 4,294,750, Cl. 260-40.00R.
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Granger, Bruce A.; and Klis, David S., 4,294,339, Cl. 192-12.0BA.
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Knowles, William S.; and Sabacky, Milton J., to Monsanto Company. Methylcyclohexyl-O-anisylphosphine. 4,294,989, Cl. 568-13.000.
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Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.
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Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.
Koomey, Inc.: *See*—
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Kotani, Hirotaro. Collapsible luggage carrier. 4,294,463, Cl. 280-646.000.
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Rock, Erich; and Mages, Bernhard, 4,294,499, Cl. 312-334.000.
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Wion, David W., 4,294,036, Cl. 46-242.000.
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Cholet, Jacques; Magneville, Pierre; and Cassand, Jean, 4,294,328, Cl. 181-120.000.
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Lindgren, Hakan O.; and Magnusson, Bengt, 4,295,033, Cl. 219-388.000.
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Cleland, Marshall R.; and Malone, Howard F., Sr., 4,295,048, Cl. 250-398.000.
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Blanchard, Carroll H.; and Marcelonis, Robert P., 4,294,557, Cl. 400-714.000.
Marconi Instruments Limited: *See*—
Middleton, John D., 4,295,093, Cl. 324-77.00B.
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Mark, Edgar, to G. L. Rexroth GmbH. Electrode-position control in arc furnaces. 4,295,000, Cl. 13-13.000.
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Reichl, Ernst; and Marloth, Herbert, 4,294,407, Cl. 239-102.000.
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McCabe, Ralph P.; and Marsh, Keith D., 4,294,282, Cl. 137-595.000.
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Martensson, Kjell H., to Tetra Pak International AB. Parallelepipedic packing container. 4,294,362, Cl. 206-622.000.
Martin, Henry, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,294,772, Cl. 260-429.700.
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Martinelli, Lawrence G.; and Garrison, Mark R., to Verbatim Corporation. Forming process for light gauge polymer sheet material. 4,294,640, Cl. 156-213.000.
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Marvin Glass & Associates: *See*—
Terzian, Rouben T., 4,294,033, Cl. 46-118.000.
Marx, Herr J., to Trutzschler GmbH & Co. KG. Tool for opening up fiber bales. 4,293,982, Cl. 19-80.00A.
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Beranger, Herve; Marzin, Claude; Omet, Dominique; and Peter, Jean-Luc, 4,295,210, Cl. 365-227.000.
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Urlaub, Alfred; and Chmela, Franz, 4,294,206, Cl. 123-276.000.
Mashimo, Yukio: *See*—
Iwashita, Tomonori; Fukahori, Hidehiko; and Mashimo, Yukio, 4,294,530, Cl. 354-173.000.
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Aslanian, Jerry L.; and Numbers, Jody L., 4,294,246, Cl. 128-214.00E.
Matra: *See*—
Broquet, Jean B., 4,294,420, Cl. 244-165.000.
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Shiraiwa, Toshio; Yamaguchi, Hisao; and Matsumoto, Shigeaki, 4,294,118, Cl. 73-620.000.
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Fujita, Mitsuo; and Matsumura, Koji, 4,295,080, Cl. 318-257.000.
Matsuno, Ryohei, to Daido Giken Industries, Co., Ltd.; and Amino Aluminium Industries, Co., Ltd. Method for agitation of molten metal and furnace for agitation of molten metal. 4,294,435, Cl. 266-234.000.
Matsuo, Kazumasa, to Olympus Optical Co., Ltd. Endoscope. 4,294,234, Cl. 128-6.000.
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Kobayashi, Masatoshi; Shimakawa, George; Hara, Yukio; Fujii, Hiroyuki; and Kabushiki Kaisha Seikosha, 4,293,986, Cl. 29-25.350.
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Fukada, Tetsuji; and Ise, Yukihiko, 4,295,172, Cl. 360-109.000.
Kawa, Hidetoshi; Mori, Kazuhiro; Misawa, Yoshihiko; and Nakagawa, Hiroshi, 4,293,998, Cl. 29-564.100.

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Kashima, Isoo; Mishina, Masami; Takase, Yosio; and Maruchi, Katsumi, 4,295,017, Cl. 200-47.000.

Matta, Joseph J.; and Skalina, Andrej, to RCA Corporation. Feed system for a circularly polarized tetra-coil antenna. 4,295,144, Cl. 343-895.000.

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Berger, Mitchell H.; Maresca, Louis M.; and Matzner, Markus, 4,294,957, Cl. 528-179.000.

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Maurer, Alexander: *See*—
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May, Michael G. Externally ignited, four-cycle, piston-type internal combustion engine. 4,294,207, Cl. 123-279.000.

Mayer, Francis X., to Exxon Research & Engineering Co. Heat transfer in magnetically stabilized, fluidized beds. 4,294,688, Cl. 208-164.000.

Mayer, Harald; and Berentzen, Hardo, to Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft. Latch needle for knitting machines. 4,294,086, Cl. 66-121.000.

Mayo, Kenneth E., to Energy Systems Corporation. Diver heater system. 4,294,225, Cl. 126-204.000.

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Fischell, David R.; and Mazique, Jeffrey C., 4,294,264, Cl. 128-778.000.

Mazzorana, Alfred B., to Societe de Paris et du Rhone. Control lever of electrical starter. 4,294,129, Cl. 74-7.00A.

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Fouse, Jack A.; and McClaren, Sherwood W., III, 4,294,419, Cl. 244-117.00R.

McDaniel, Max P., to Phillips Petroleum Company. Titanium impregnated silica-chromium catalysts. 4,294,724, Cl. 252-451.000.

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McIntosh, Lester A., deceased, 4,294,439, Cl. 267-54.00A.

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Webb, Edward A.; McKenna, John F.; and Makar, Frank B., Jr., 4,295,075, Cl. 313-220.000.

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Wood, Donald C.; and McLaughlin, Robert L., 4,294,855, Cl. 424-358.000.

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Person, Abraham; Wetmore, Sherman B.; and McNary, James F., 4,294,564, Cl. 405-195.000.

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Carson, John R., 4,294,760, Cl. 260-326.470.

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Mead Corporation, The: *See*—
Rutledge, Wyman C.; Graves, J. Robert; and Cassill, William G., 4,294,111, Cl. 73-150.00R.

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Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

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Borio, Richard W.; and Mehta, Arun K., 4,294,178, Cl. 110-347.000.

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Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

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Hidaka, Hidemasa; Kohno, Toshiaki; and Eida, Toshiaki, 4,294,623, Cl. 127-55.000.

Meiners, Hans-Joachim: *See*—
Grogler, Gerhard; Schwindt, Jurgen; Ganster, Otto; Meiners, Hans-Joachim; and Ruprecht, Hans-Dieter, 4,294,934, Cl. 521-160.000.

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Fennel, John W., Jr.; Hallett, Robert J.; Head, Stanley M.; and Melas, Constantine M., 4,295,217, Cl. 370-81.000.

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Sloane, Thomas E., Jr.; Melius, Clair; and Kling, Erich, 4,294,594, Cl. 55-186.000.

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Baldwin, John J.; and Ponticello, Gerald S., 4,294,969, Cl. 546-286.000.
Monaghan, Richard L.; Alberts, Alfred W.; Hoffman, Carl H.; and Albers-Schonberg, George, 4,294,926, Cl. 435-125.000.
Tull, Roger J.; Weinstock, Leonard M.; and Shinkai, Ichiro, 4,294,988, Cl. 564-417.000.

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Doll, Thomas; Schacht, Erich; Radunz, Hans-Eckart; and Schulze, Ernst, 4,294,839, Cl. 424-263.000.

Merger, Franz; and Towae, Friedrich, to BASF Aktiengesellschaft. Preparation of N-aryloxazolidine-2,4-diones. 4,294,971, Cl. 548-226.000.

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Arons, Irving J.; Merrill, Richard E.; and Drennan, Arthur P., 4,294,792, Cl. 264-311.000.

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Schlicklin, Philippe; Mertzweiller nee Maillard, Anne-Marie; and Ploussard, Jacques, 4,294,617, Cl. 106-14.370.

Meschnig, Albin. Lockable cap screw. 4,294,570, Cl. 411-103.000.

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Heyes, Peter J., 4,294,627, Cl. 148-6.14R.

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Lohrberg, Karl; Bielz, Siegfried; and Janisch, Paul, 4,294,815, Cl. 423-478.000.

Metz, Gunter; and Specker, Manfred. Aminobenzoic acid derivatives. 4,294,851, Cl. 424-311.000.

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Preiss, Michael; and Metzger, Karl G., 4,294,827, Cl. 424-226.000.

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Meyer, John H.; and Guerra, Salvatore, to Ford Motor Company. Coated glass article. 4,294,881, Cl. 428-334.000.

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Lipowsky, Dieter; and Meyle, Karl, 4,294,568, Cl. 409-244.000.

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Buchmuller, Horst; and Michelbrink, Bernhard, 4,294,592, Cl. 55-120.000.

Middleton, John D., to Marconi Instruments Limited. Spectrum analysers. 4,295,093, Cl. 324-77.00B.

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Jensen, Kenneth D., 4,294,071, Cl. 60-547.00A.

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Mifsud, Joseph F., to Exxon Production Research Company. Composite seismic signal. 4,295,213, Cl. 367-41.000.

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Barach, Jeffrey T.; and Bluhm, Leslie, 4,294,930, Cl. 435-261.000.
Johnson, Leighton C., 4,294,866, Cl. 427-2.000.

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Graham, Alan A.; Haemer, Laurence F.; and Miller, Charles H., 4,294,786, Cl. 264-46.400.

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Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., 4,295,096, Cl. 324-357.000.

Miller, Edward C.; and Straw, David A., to Ball Corporation. Lightweight metal container. 4,294,373, Cl. 220-70.000.

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Miller, Kenneth L. Dispenser for and method of dispensing a material from a non-pressurized material reservoir. 4,294,381, Cl. 222-1.000.

Miller, Ronald J. Tool and method for holding automotive valves closed during servicing. 4,294,141, Cl. 81-3.00R.

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Su, Tien-Kuei, 4,294,747, Cl. 260-37.00R.

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Thill, Gary A., 4,294,240, Cl. 128-156.000.

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Ohta, Yoshiharu; and Naya, Mikio, 4,294,528, Cl. 354-33.000.

Minorikawa, Hitoshi: *See*—
Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, 4,295,115, Cl. 338-4.000.

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Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.

Misawa, Yoshihiko: *See*—
Kawa, Hidetoshi; Mori, Kazuhiro; Misawa, Yoshihiko; and Nakagawa, Hiroshi, 4,293,998, Cl. 29-564.100.

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Kubota, Michio; Takagi, Kazuhiro; and Mitani, Yorimasa, 4,294,632, Cl. 148-142.000.

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Fujiwara, Ichiroh; Motoki, Yoshiaki; Inoue, Toshinori; and Fukuoka, Kazuma, 4,295,015, Cl. 200-38.00R.
Morishita, Mitsuharu; and Iwaki, Yoshiyuki, 4,295,087, Cl. 322-99.000.
Uesaka, Tatsuo; Sugahara, Hiroshi; and Fujimura, Takeo, 4,295,110, Cl. 335-212.000.
Yamada, Yoshito; Okumura, Hiroshi; and Murakami, Shoji, 4,295,112, Cl. 336-84.00M.

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Ifuku, Yasushi; Uchiyama, Hirofumi; and Hayashi, Masayuki, 4,294,861, Cl. 426-475.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Hashimoto, Fukashi, 4,294,889, Cl. 428-515.000.
Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, 4,294,933, Cl. 521-27.000.

Mitsuhashi, Yasuhiro, to Nippon Gakki Seizo Kabushiki Kaisha. Method of synthesizing musical tones. 4,294,153, Cl. 84-1.010.

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Sugita, Toshio; Sakaguchi, Hiroaki; Tsuda, Hisanobu; and Suzuki, Tsuyoshi, 4,294,951, Cl. 528-55.000.

Mitsui Petrochemical Industries Ltd.: *See*—
Toyota, Akinori; Yoshitugu, Ken; and Kashiwa, Norio, 4,294,948, Cl. 526-125.000.

Miura, Shuichi: *See*—
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Miyagishima, Tosh; Puntar, Joseph; and Wieveg, Raymond, to Hydril Company. Inside blowout preventer well tool. 4,294,314, Cl. 166-318.000.

Miyahara, Masayoshi: *See*—
Kisaka, Hiroyuki; Sagata, Makoto; Miyahara, Masayoshi; and Katayama, Morimitsu, 4,294,130, Cl. 74-15.400.

Miyake, Shunji: *See*—
Kodera, Yuji; Ikari, Kyoichiro; and Miyake, Shunji, 4,294,935, Cl. 525-60.000.

Miyamoto, Tomohiko: *See*—
Uchida, Seiichi; Satomi. Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

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Miyata, Teruo. Collagen skin dressing. 4,294,241, Cl. 128-156.000.

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Mizuguchi, Ryuzo; Ishikura, Sinichi; Ishii, Keizou; and Yoshioka, Tamotu, to Nippon Paint Co., Ltd. Process for preparing acrylic resin emulsions. 4,294,740, Cl. 260-29.6RB.

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Lindahl, Jonas A. I.; and Rudstrom, Lars G., 4,294,653, Cl. 162-25.000.

Moertel, George B., to Textron, Inc. Slidering method and apparatus. 4,293,994, Cl. 29-409.000.

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Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, 4,294,828, Cl. 424-232.000.

Monsanto Company: *See*—
Bach, Hartwig C.; and Hinderer, Helmuth E., 4,294,884, Cl. 428-364.000.
Knowles, William S.; and Sabacky, Milton J., 4,294,989, Cl. 568-13.000.
Kowalski, Xavier, 4,294,575, Cl. 8-111.000.
Newman, Randolph E., 4,294,652, Cl. 159-2.00R.

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Cecchin, Giuliano; and Albizzati, Enrico, 4,294,721, Cl. 252-429.00B.

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Yao, Shang J.; Sun Yao, Huei Y.; and Wolfson, Sidney K., Jr., 4,294,891, Cl. 429-2.000.

Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Flavoring with mixture of nor-methyl jasmonate and dihydro-nor-methyl jasmonate. 4,294,863, Cl. 426-538.000.

Mookil, Byun. Method for manufacturing a solid statue. 4,294,634, Cl. 156-59.000.

Mooney, Donald B.: *See*—
Balyoz, John; Chang, Chi S.; Fox, Barry C.; Palmieri, John A.; Ghafghaichi, Majid; Jen, Teh-Sen; and Mooney, Donald B., 4,295,149, Cl. 357-45.000.

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Davenport, Robert W.; Moore, Eugene L.; and Goodman, Ronald L., 4,294,042, Cl. 51-54.000.

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Laskow, William; and Morelock, Charles R., 4,294,788, Cl. 264-101.000.

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Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., 4,294,243, Cl. 128-201.180.

Mori, Kazuhiro: *See*—
Kawa, Hidetoshi; Mori, Kazuhiro; Misawa, Yoshihiko; and Nakagawa, Hiroshi, 4,293,998, Cl. 29-564.100.

Mori, Keiji; and Kurimoto, Kyoichi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Actuating handle means. 4,294,134, Cl. 74-547.000.

Mori, Mamoru: *See*—
Kinaga, Eiichi; and Mori, Mamoru, 4,294,468, Cl. 280-807.000.

Morimoto, Takao: *See*—
Sugahara, Syunji; and Morimoto, Takao, 4,294,142, Cl. 81-57.370.

Morishita, Mitsuharu; and Iwaki, Yoshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Charge indicator circuit for a battery charging system. 4,295,087, Cl. 322-99.000.

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Kruger, Jorg; Thome, Roland; Moritz, Dieter; Bings, Hubert; and Losert, Herbert, 4,294,816, Cl. 423-484.000.

Morris Whaley, Inc.: *See*—
Whaley, Morris L., 4,294,495, Cl. 308-174.000.

Mosse, Barbara; and Thompson, John P., to National Research Development Corporation. Production of mycorrhizal fungi. 4,294,037, Cl. 47-59.000.

Moto, Masato; and Ito, Seigo, to Futaba Denshi Kogyo K.K. Pulse width modulated servo circuit. 4,295,082, Cl. 318-599.000.

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Motomuro, Hisanao: *See*—
Hara, Haruichi; Kanzaki, Toshihide; Motomuro, Hisanao; and Adachi, Akiyoshi, 4,294,723, Cl. 252-440.000.
Motor Wheel Corporation: *See*—
Woelfel, James A., 4,294,490, Cl. 301-63.0PW.
Woelfel, James A.; and Smith, Richard W., 4,294,639, Cl. 156-185.000.
Motoren- und Turbinen-Union Munchen GmbH: *See*—
Lipowsky, Dieter; and Meyle, Karl, 4,294,568, Cl. 409-244.000.
Motorola Inc.: *See*—
Price, John J., Jr., 4,295,063, Cl. 307-362.000.
Motosugi, Katsuhiko: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.
Moule, Rex E. Self-surfaced meat product manufacturing method and apparatus. 4,294,858, Cl. 426-241.000.
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Anderson, Norman; Peak, Richard; and Moyse, James A., 4,294,709, Cl. 252-8.800.
Mukaida, Yutaka: *See*—
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Mukoyama, Yoshiyuki; and Sakata, Touichi, to Hitachi Chemical Company, Ltd. Polyamide-imide resin and its production. 4,294,952, Cl. 528-67.000.
Mullenberg, Ralph. Polygon connection of a hub with a shaft. 4,294,562, Cl. 403-383.000.
Muller, Klaus: *See*—
Maurer, Helmut; Muller, Klaus; Linder, Ernst; Rieger, Franz; and Stecher, Gunther, 4,294,679, Cl. 204-195.00S.
Muller, Rolf, to Robert Bosch GmbH. Method and system to optimize recording conditions in magnetic recording systems. 4,295,168, Cl. 360-66.000.
Munters Corporation: *See*—
Tennyson, Richard P., 4,294,663, Cl. 201-39.000.
Murai, Asao: *See*—
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Murakami, Masanori: *See*—
Kircher, Charles J.; Huang, Hung-Chang W.; and Murakami, Masanori, 4,295,147, Cl. 357-5.000.
Murakami, Shoji: *See*—
Yamada, Yoshito; Okumura, Hiroshi; and Murakami, Shoji, 4,295,112, Cl. 336-84.00M.
Murakami, Takashi: *See*—
Ariyama, Kenzo; Miyawaki, Syozo; and Murakami, Takashi, 4,294,535, Cl. 355-14.0SH.
Murao, Sawao: *See*—
Takahara, Yoshiyuki; Hirose, Yoshiteru; Takeuchi, Yoko; Murai, Asao; Kainosho, Masatsune; and Murao, Sawao, 4,294,754, Cl. 260-112.50R.
Murasaki, Hiroaki: *See*—
Mitani, Akio; Sakamoto, Moriyoshi; and Murasaki, Hiroaki, 4,294,081, Cl. 62-140.000.
Murata Manufacturing Co., Ltd.: *See*—
Ieki, Hideharu, 4,295,108, Cl. 333-193.000.
Murayama, Naohiro: *See*—
Sakagami, Teruo; Kato, Tadaaki; Hirai, Toru; and Murayama, Naohiro, 4,294,677, Cl. 204-181.00F.
Murayama, Yoshinobu, to Kubota, Ltd. Tractor travelling system transmission mechanism. 4,294,131, Cl. 74-15.400.
Murez, James D., to GM Research. Portable computer enclosure. 4,294,496, Cl. 312-208.000.
Murphy, Preston V., to Lectret S.A. Plural piezoelectric polymer film acoustic transducer. 4,295,010, Cl. 179-110.00A.
Murthy, Rajam R., to Koomey, Inc. Accumulator with float orienting means. 4,294,288, Cl. 138-30.000.
Naaktgeboren, Adrianus: *See*—
Decoene, Frans J. G. C.; Hommez, Etienne R. O. C.; and Naaktgeboren, Adrianus, 4,294,346, Cl. 198-740.000.
Nab, Joseph J. Sole for logging boot. 4,294,024, Cl. 36-113.000.
Nagai, Tsuneji: *See*—
Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, 4,294,829, Cl. 424-241.000.
Nagao, Tsukasa. Optical circulators. 4,294,509, Cl. 350-96.150.
Nagase, Hiroshi; Okuyama, Toshiaki; Kubota, Yuzuru; and Suzuki, Katsunori, to Hitachi, Ltd. Control apparatus of synchronous motor having thyristor converter. 4,295,084, Cl. 318-719.000.
Nagibin, Vladimir D.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.
Nagy, Janos: *See*—
Knoll, Jozsef; Kalasz, Huba; Knoll, Berta; and Nagy, Janos, 4,294,825, Cl. 424-101.000.
Naito, Kenji: *See*—
Iiyama, Masahiko; Sanka, Tsugio; and Naito, Kenji, 4,294,205, Cl. 123-274.000.
Nakagawa, Hiroshi: *See*—
Kawa, Hidetoshi; Mori, Kazuhiro; Misawa, Yoshihiko; and Nakagawa, Hiroshi, 4,293,998, Cl. 29-564.100.
Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Automatic focusing camera combined with manual focusing system. 4,294,526, Cl. 354-25.000.
Nakagawa, Tadashi, to Seiko Koki Kabushiki Kaisha. Shutter blade device for focal plane shutter. 4,294,532, Cl. 354-246.000.
Nakagawa, Taizo; Matsumoto, Hiroshi; Ohmori, Kaoru; Shimano, Shizuo; and Koike, Kengo, to Nippon Kayaku Kabushiki Kaisha. 2-Hydroxy benzamide derivatives and use thereof as a fungicide. 4,294,835, Cl. 424-263.000.
Nakahara, Akihiko: *See*—
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,294,943, Cl. 525-358.000.
Nakai, Masaaki: *See*—
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.
Nakai, Osamu: *See*—
Okada, Yoshitsugu; and Nakai, Osamu, 4,294,428, Cl. 251-214.000.
Nakai, Syunzi; and Nakao, Motokazu, to Sharp Kabushiki Kaisha. Liquid electrostatic image developing system employs mesh development electrode. 4,294,192, Cl. 118-650.000.
Nakajima, Yukio: *See*—
Hashimoto, Akihiko; Nakajima, Yukio; Koiwai, Tamotsu; and Kimura, Toyohiko, 4,294,527, Cl. 354-25.000.
Nakamura, Yoshiharu, to Nissan Motor Company, Limited. Car body. 4,294,487, Cl. 296-188.000.
Nakane, Masao: *See*—
Shinoda, Akibumi; and Nakane, Masao, 4,294,334, Cl. 188-18.00A.
Nakao, Motokazu: *See*—
Nakai, Syunzi; and Nakao, Motokazu, 4,294,192, Cl. 118-650.000.
Nakatsuji, Tadao: *See*—
Abe, Kazunobu; Tamura, Shoichi; and Nakatsuji, Tadao, 4,294,806, Cl. 423-239.000.
Nakauchi, Hiroshi; Koyanagi, Katubumi; Inami, Yasuhiko; and Uede, Hisashi, to Sharp Corporation. Combined constant potential and constant voltage driving technique for electrochromic displays. 4,295,138, Cl. 340-785.000.
Naoi, Takashi: *See*—
Yamaguchi, Jun; Naoi, Takashi; Sera, Hidefumi; Ishigaki, Kunio; and Ogawa, Masasi, 4,294,921, Cl. 430-621.000.
Narten, Nathaniel C.: *See*—
Greenwald, A. Seth; Geiger, Jack M.; Narten, Nathaniel C.; Porritt, Derek S.; Combs, Steven P.; and Brems, John J., 4,294,251, Cl. 128-276.000.
Nash, Patrick L. Connecting device. 4,294,476, Cl. 285-189.000.
Naslund, Jan I. Method for processing a body liquid specimen. 4,294,582, Cl. 23-230.00B.
National Instrument Company, Inc.: *See*—
Bennett, Richard N., 4,294,294, Cl. 141-179.000.
National Research Development Corporation: *See*—
Heap, Robert B., 4,294,922, Cl. 435-7.000.
Mosse, Barbara; and Thompson, John P., 4,294,037, Cl. 47-59.000.
National Semiconductor Corporation: *See*—
Mihalich, Stephen K.; and Wong, Thomas S. W., 4,295,062, Cl. 307-279.000.
Roybal, Philip M., 4,295,124, Cl. 340-347.0DD.
Nauheimer, James F.; and Benzschawel, Steven J., to Container Corporation of America. Package for video tubes. 4,294,358, Cl. 206-419.000.
Naya, Mikio: *See*—
Ohta, Yoshiharu; and Naya, Mikio, 4,294,528, Cl. 354-33.000.
Nayar, Harbhajan S., to Airco, Inc. Brazing process. 4,294,395, Cl. 228-220.000.
Naylor, Arthur V.; and Spencer, John K., to Baker Perkins Holdings Limited. Sweet forming and wrapping machine. 4,294,060, Cl. 53-506.000.
NCR Canada Ltd.-NCR Canada Ltee: *See*—
Cain, John D.; and Lovie, Gary C., 4,295,206, Cl. 364-900.000.
Nedschroef Octrooi Maatschappij N.V.: *See*—
Bouwman, Johannes E., 4,294,300, Cl. 411-185.000.
Neeff, Rutger: *See*—
Krock, Friedrich W.; and Neeff, Rutger, 4,294,578, Cl. 8-516.000.
Krock, Friedrich W.; Neeff, Rutger; and Scheiter, Heinz, 4,294,769, Cl. 260-378.000.
Neff, Joseph J., to Cummins Engine Company, Inc. Integral turbine housing and exhaust collector section. 4,294,073, Cl. 60-597.000.
Neiman, David C.: *See*—
Kreinbrink, Paul H.; and Neiman, David C., 4,295,038, Cl. 235-92.0PK.
Nelson, David E.; and Bouyoucos, John V., to Hydroacoustics Inc. Optical sensor system. 4,294,513, Cl. 350-96.290.
Nelvig, Lars T.: *See*—
Bohlin, Karl G.; Fredriksson, Borje I.; Karlsson, Kent A. B.; and Nelvig, Lars T., 4,294,412, Cl. 241-30.000.
Neumiller, Phillip J., to S. C. Johnson & Son, Inc. Odor absorbing compositions. 4,294,821, Cl. 424-45.000.
Newkirk, David D.; Login, Robert B.; and Thir, Basil, to BASF Wyandotte Corporation. Flame retardant antistatic additives and antistatic fibers. 4,294,944, Cl. 525-423.000.

Newman, Randolph E., to Monsanto Company. Falling strand devolatilizer. 4,294,652, Cl. 159-2.00R.

NGK Insulators, Ltd.: *See*—
Haga, Toshikatsu; Fukuda, Hiroyuki; Shinoda, Hiroshi; and Hayakawa, Hideharu, 4,294,795, Cl. 264-332.000.

Nicholson, James A. Support bracket and open shelving assembly. 4,294,177, Cl. 108-42.000.

Nicks, Peter F., to Imperial Chemical Industries Limited. Production of coating films from autoxidizable materials and coating compositions capable of producing such films. 4,294,887, Cl. 428-423.100.

Nims, Philip A.; and Bollinger, Roger K., to Crompton & Knowles Corporation. Shuttle retaining apparatus. 4,294,291, Cl. 139-438.000.

Nippon Clean Engine Laboratory Co.: *See*—
Onishi, Shigeru, 4,294,372, Cl. 220-20.000.

Nippon Electric Co., Ltd.: *See*—
Tokoda, Saburo; Okumura, Koichiro; and Sugimoto, Eiji, 4,295,061, Cl. 307-279.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Mitsuhashi, Yasuhiro, 4,294,153, Cl. 84-1.010.

Nippon Kayaku Kabushiki Kaisha: *See*—
Nakagawa, Taizo; Matsumoto, Hiroshi; Ohmori, Kaoru; Shimano, Shizuo; and Koike, Kengo, 4,294,835, Cl. 424-263.000.

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Maida, Osamu, 4,294,525, Cl. 354-23.00D.

Nippon Kokan Kabushiki Kaisha: *See*—
Okado, Masaru; and Ariizumi, Takashi, 4,294,094, Cl. 72-16.000.
Sawada, Hajimu; and Inubushi, Hisao, 4,294,437, Cl. 266-272.000.

Nippon Mining Co., Ltd.: *See*—
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

Nippon Paint Co., Ltd.: *See*—
Mizuguchi, Ryuzo; Ishikura, Sinichi; Ishii, Keizou; and Yoshioka, Tamotu, 4,294,740, Cl. 260-29.6RB.
Yamamoto, Takashi; and Amako, Hiroshi, 4,294,667, Cl. 204-1.00T.

Nippon Rotary Nozzle Co., Ltd.: *See*—
Sawada, Hajimu; and Inubushi, Hisao, 4,294,437, Cl. 266-272.000.

Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See*—
Hara, Haruichi; Kanzaki, Toshihide; Motomuro, Hisanao; and Adachi, Akiyoshi, 4,294,723, Cl. 252-440.000.

Nippon Soken, Inc.: *See*—
Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, 4,294,801, Cl. 422-98.000.

Nippon Steel Corporation: *See*—
Kawano, Tsuyoshi; Usuda, Matsuo; and Hirokawa, Toshio, 4,294,095, Cl. 72-51.000.

Nippon Telegraph, Telephone Public Corp.: *See*—
Hata, Hidetoh; Haji, Katsumi; Sako, Kazushige; Shibata, Yoji; and Achiha, Masahiko, 4,295,154, Cl. 358-4.000.

Nishida, Masazo, to Toyo Rubber Industry Co., Ltd., The. Foamed polyurethane articles with skin and a method for producing the same. 4,294,880, Cl. 428-315.000.

Nishiguchi, Hisanori: *See*—
Takashima, Yuji; Ishida, Eisuke; Nishiguchi, Hisanori; and Yoshino, Kimiaki, 4,294,902, Cl. 430-45.000.

Nishihara, Motohisa: *See*—
Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, 4,295,115, Cl. 338-4.000.

Nishimura, Yoshinori; Umeda, Kaoru; and Harada, Hideo, to Sony Corporation. Tuning indicator apparatus for a frequency synthesizer tuner. 4,295,224, Cl. 455-156.000.

Nishiyama, Yoshihisa, to Tokyo Electric Co., Ltd. Electronic weight measuring device. 4,294,322, Cl. 177-210.00R.

Niskovskikh, Vitaly M.: *See*—
Berenov, Alexandr D.; Krainev, Vladislav P.; Mansurov, Midkhat M.; Niskovskikh, Vitaly M.; and Silin, Evgeny L., 4,294,306, Cl. 164-448.000.

Nissan Motor Company, Limited: *See*—
Abo, Toshimi; and Hosaka, Akio, 4,294,216, Cl. 123-489.000.
Ideta, Yasufumi; Takeda, George; and Watanabe, Shoei, 4,294,160, Cl. 91-378.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,294,140, Cl. 74-868.000.
Nakamura, Yoshiharu, 4,294,487, Cl. 296-188.000.
Shimizu, Kazuaki, 4,294,336, Cl. 188-72.400.
Yasuhara, Seishi; and Ohnishi, Eiichi, 4,294,220, Cl. 123-568.000.

Nissen, Nico; Op Het Veld, Sebastianus J.; and Schneider, Henri W., to U.S. Philips Corporation. Digital frequency divider. 4,295,158, Cl. 358-17.000.

Nisshin Steel Co., Ltd.: *See*—
Kubota, Michio; Takagi, Kazuhiro; and Mitani, Yorimasa, 4,294,632, Cl. 148-142.000.

Noda, Teruaki: *See*—
Watanabe, Yasuaki; and Noda, Teruaki, 4,295,165, Cl. 358-193.100.

Nomura, Yoshihiko, to Aisin Seiki Kabushiki Kaisha. Power assisted steering system for vehicles. 4,294,325, Cl. 180-148.000.

Noranda Mines Limited: *See*—
LeRoy, Rodney L., 4,294,274, Cl. 137-7.000.

Norbedo, Robert A.; and Resnick, Martin L., to GTE Laboratories Incorporated. Signalling system including apparatus for generating and testing data and command words within first and second message intervals. 4,295,208, Cl. 364-900.000.

Nordson Corporation: *See*—
Hastings, Donald R.; and Harjar, Martin J., 4,294,411, Cl. 239-707.000.

Nordstrom, Immo R.; and Bak, Johannes A. System for securing containers in a ship's hold. 4,294,185, Cl. 114-75.000.

Norman, Melvin H.: *See*—
Sheehan, Neil J.; and Norman, Melvin H., 4,294,249, Cl. 128-214.00G.

Norprint Limited: *See*—
Figg, Anthony V. J.; and Cunnington, Harry, 4,294,645, Cl. 156-384.000.

Norris, Jerry L.: *See*—
Schmidt, Gary D.; Norris, Jerry L.; and Weirauch, Donald F., 4,295,102, Cl. 331-65.000.

Northern Telecom Limited: *See*—
Read, Clifford D., 4,295,179, Cl. 361-331.000.

Nouda, Hiroshi; Tanihara, Yoshiaki; Ikeda, Takashi; and Ogiuchi, Ituo, to Teijin Limited. Process for producing thermoplastic resin film of markedly reduced thickness unevenness. 4,294,791, Cl. 264-210.200.

Nuclear Power Company Limited: *See*—
Seed, Geoffrey; Chesworth, Graham; Hind, John R.; and Hodgson, Donald, 4,294,661, Cl. 376-363.000.

Numbers, Jody L.: *See*—
Aslanian, Jerry L.; and Numbers, Jody L., 4,294,246, Cl. 128-214.00E.

Nystrom, William A.; Lanzel, Leo C.; and Bauer, William A., to Stackpole Corporation, The. Replaceable liner for a crucible. 4,294,438, Cl. 266-280.000.

Nyul, Paul; and Hughes, Frederick R., to RCA Corporation. Method of bonding two parts together and article produced thereby. 4,295,151, Cl. 357-68.000.

Oakley, John F.: *See*—
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Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., 4,294,798, Cl. 422-62.000.
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Nissen, Nico; Op Het Veld, Sebastianus J.; and Schneider, Henri W., 4,295,158, Cl. 358-17.000.
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Kakihara, Naomichi; Harada, Yoshiaki; and Uedono, Norio, 4,294,706, Cl. 210-762.000.
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Yonker, John H.; Fisher, Ernest P., Jr.; and Bills, David, 4,294,315, Cl. 166-322.000.
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Behn, Reinhard; Heywang, Hermann; and Pachonik, Horst, 4,294,194, Cl. 118-719.000.
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Laska, Ronald C.; and Pone, Janis, 4,294,537, Cl. 355-35.000.
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Paxton, Kenneth B., to Eastman Kodak Company. Automatic control of copier copy contrast and density for production runs. 4,294,536, Cl. 355-14.00C.

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Schutzler, Jerome C., 4,294,559, Cl. 403-28.000.

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Black, John W., 4,294,491, Cl. 301-63.0DD.

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Erickson, John W.; and Petrie, Harold L., 4,294,573, Cl. 417-83.000.

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Philip Morris Incorporated: *See—*
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Burns, Lyle D., 4,294,587, Cl. 44-74.000.
Cheng, Paul J., 4,294,814, Cl. 423-457.000.
Furr, Danny L., 4,295,196, Cl. 364-501.000.
McDaniel, Max P., 4,294,724, Cl. 252-451.000.

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Pohl, Walter, to Eaton Corporation. Thermo-switch. 4,295,114, Cl. 337-3.000.

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Weiderrich, LeRoy J., 4,293,966, Cl. 6-12.00R.

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Rinehart, Jay K., 4,294,764, Cl. 260-340.90R.
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Hardy, Frederick E.; and Dewar, Colin A., 4,294,710, Cl. 252-8.800.
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Racine, Pierre. Liquid dispensing receptacle. 4,294,369, Cl. 215-311.000.
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Fuller, Mary L., 4,294,857, Cl. 426-99.000.
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Solomons, Gerald L.; and Scammell, Gerald W., 4,294,929, Cl. 435-254.000.
Rasmussen, Ole-Bendt. Circular extrusion method providing for rotation around the extrusion opening. 4,294,638, Cl. 156-176.000.
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Carter, Don R.; Doner, Claude E.; Hammersand, Fred G.; and Tomcavage, Joseph R., 4,295,077, Cl. 313-293.000.
Crowley, Albert T., 4,295,098, Cl. 328-24.000.
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Wilmarth, Paul C., 4,295,078, Cl. 315-8.000.
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Tucker, Alfred D., 4,294,470, Cl. 285-5.000.
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Piret, Jean; and Jallas, Michel, 4,294,137, Cl. 74-665.00G.
Reh, Walter, to Bayerische Motoren Werke Aktiengesellschaft. Friction clutch for motor vehicles. 4,294,343, Cl. 192-113.00A.
Rehm, William A. Drilling mud degasser apparatus and system. 4,294,593, Cl. 55-166.000.
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Wetzel, William H.; Pan, Hsi-Lung; Goodwin, Robert J.; and Wilkinson, John E., 4,294,996, Cl. 568-776.000.
Reichl, Ernst; and Marloth, Herbert, to Bosch-Siemens Hausgerate GmbH. Atomizer for fluids, preferably an inhalation device. 4,294,407, Cl. 239-102.000.
Reid, Samuel C. M. Analog-to-digital converter. 4,295,123, Cl. 340-347.0AD.
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Stevens, John H.; and Reidel, Bruce A., 4,294,357, Cl. 206-409.000.
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Remond, Jean R. A., to Etablissements F. Nicollet & Cie Societe Anonyme. Suspension-type file folder. 4,294,028, Cl. 40-359.000.
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Blair, Matthew J.; and Wiktorowski, Thomas A., 4,294,432, Cl. 266-46.000.
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Roen, Richard A., 4,295,031, Cl. 219-125.120.
Resnick, Martin L., to GTE Laboratories Incorporated. Data processing apparatus for receiving and decoding words in which data is encoded by phase reversals or non-phase reversals of a signal of a predetermined frequency. 4,295,207, Cl. 364-900.000.
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Reynoir, Ronald H.; Flautt, Robert A.; and Leavitt, Clyde M., 4,294,331, Cl. 182-10.000.
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Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,294,704, Cl. 210-651.000.
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Pittasch, Willi; and Dalbert, Johannes, 4,293,976, Cl. 16-129.000.
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Summers, Kenneth L.; and Rieke, Mahlon E., 4,294,382, Cl. 222-529.000.
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Knoll, Jozsef; Kalasz, Huba; Knoll, Berta; and Nagy, Janos, 4,294,825, Cl. 424-101.000.
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Ricke, Cyril T., Sr., to Security Shutter Corp. Shutter and awning device. 4,294,302, Cl. 160-133.000.
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Ariyama, Kenzo; Miyawaki, Syozo; and Murakami, Takashi, 4,294,535, Cl. 355-14.0SH.
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Riedel, Rudolph T. Design for flush tank control using non-buoyant flapper valve. 4,293,964, Cl. 4-378.000.
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Rinehart, Jay K., to PPG Industries, Inc. N-(Optionally substituted 1,3-dioxolan- or dioxan-2-ylmethyl)-N-alkyl, alkenyl, or alkynyl-2,2-dichloroacetamides. 4,294,764, Cl. 260-340.90R.
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Sautter, Helmut; Hurst, Kurt; and Schink, Rainer, 4,295,127, Cl. 340-373.000.
Stumpp, Gerhard; and Wessel, Wolf, 4,294,211, Cl. 123-379.000.
Roberts, Joseph A., to Advanced Circuit Technology. Circuit board with self-locking terminals. 4,295,184, Cl. 361-406.000.
Robertshaw Controls Company: *See*—
Buckshaw, Thomas M., 4,295,019, Cl. 200-61.200.
Robertson, Robert H., to Ronbil Industries, Inc. Vehicle camper. 4,294,484, Cl. 296-156.000.
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Thompson, Robert B., 4,295,214, Cl. 367-140.000.
Wagner, William R., 4,294,208, Cl. 123-285.000.
Rodenberg, Joseph H.; and Gilcrest, Richard K. Hog farrowing module. 4,294,195, Cl. 119-20.000.
Rody, Jean, to Ciba-Geigy Corporation. Polyalkylpiperidine derivatives of s-triazine. 4,294,963, Cl. 544-198.000.
Roen, Richard A., to Research Council of Alberta, The. Arc welding apparatus with oscillating electrode. 4,295,031, Cl. 219-125.120.
Rogan, Bruce R.: *See*—
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Rogers, William H., to Alpha Plastics, Inc. Rapidly separable holster and holster-carrying belt. 4,294,385, Cl. 224-240.000.
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Rose, Philip M.; and Riel, Frank J., to Rohr Industries, Inc. Double layer attenuation panel with two layers of linear type material. 4,294,329, Cl. 181-222.000.
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Rosenthal, Christian: *See*—
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Ross, Lawrence M. Traction bag. 4,294,405, Cl. 238-14.000.
Ross, Michael D.: *See*—
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Roth, Eldon N. Refrigerating meat paste. 4,294,860, Cl. 426-417.000.
Roth, Joseph A.: *See*—
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Roullet, Robert: *See*—
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Rowe, Bryant T. Fuel heating system for an engine. 4,294,219, Cl. 123-557.000.
Rowe, Lacy A. Sealing means for gutter hanger fastening means. 4,294,423, Cl. 248-48.200.
Roybal, Philip M., to National Semiconductor Corporation. Communication method and system. 4,295,124, Cl. 340-347.0DD.
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Rugen, Donald F.; and Dickason, Alan F., to Sun Oil Company of Pennsylvania. Plasticized vinyl resins containing a linear mono C_{12}alkyl diphenyl compound. 4,294,742, Cl. 260-31.80H.

Rump, Bjorn S., to Rump, Bjorn Sigurd. Process for manufacture of a wide patterned band such as a transfer-carrying sheet and for printing on a substrate therewith. 4,294,637, Cl. 156-157.000.
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Runge, Thomas M. Pulsatile flow cardiopulmonary bypass pump. 4,293,961, Cl. 3-1.700.
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Saab-Scania AB: *See*—
Olsson, Lars J., 4,294,149, Cl. 83-435.100.
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Knowles, William S.; and Sabacky, Milton J., 4,294,989, Cl. 568-13.000.
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Saiki, Yukihiro: *See*—
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Sakcriska, Glenn. Ice skate sharpener. 4,294,043, Cl. 51-100.00R.
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Saltzman, Philip A.: *See*—
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Salway, Peter H.: *See*—
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Welch, James A., 4,294,026, Cl. 37-8.000.
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Sautter, Helmut; Hurst, Kurt; and Schink, Rainer, to Robert Bosch GmbH. Information display device. 4,295,127, Cl. 340-373.000.
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Bohlin, Karl G.; Fredriksson, Borje I.; Karlsson, Kent A. B.; and Nelvig, Lars T., 4,294,412, Cl. 241-30.000.
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Schar, Ernst. Floor cleaning device. 4,293,973, Cl. 15-230.170.
Scharres, Harry J. Wedge sealed damper. 4,294,283, Cl. 137-601.000.
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Scheffel, Herbert; von Gericke, Rowlen E.; and Viviers, Joseph A., to South African Inventions Development Corporation. Railway wheel tread profile. 4,294,482, Cl. 295-34.000.
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Schmitt, Frederick L.: *See—*
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Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., 4,294,266, Cl. 131-277.000.
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Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, to Nippon Soken, Inc. Gas component detector. 4,294,801, Cl. 422-98.000.
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Shaw, James K. Amusement device. 4,294,449, Cl. 273-126.00R.
Sheehan, Neil J.; and Norman, Melvin H., to Cutter Laboratories, Inc. Swage-molded injection site. 4,294,249, Cl. 128-214.00G.
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Verschuur, Eke, 4,294,584, Cl. 44-23.000.
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Shemitz, Norman S., to Shem Safe Incorporated. Assemblable container. 4,295,187, Cl. 362-352.000.
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Sheppard, Peter H. Power steering gear with oil filled capillary balancing slots. 4,294,161, Cl. 91-422.000.
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Shutterly, Harold B., to Westinghouse Electric Corp. Digital signal/-noise ratio amplifier apparatus for a communication system. 4,295,223, Cl. 455-72.000.
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Kraemer, Horst, 4,295,100, Cl. 330-257.000.
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Siewerdt, Lothar, to Kernforschungszentrum Karlsruhe GmbH. High voltage cable. 4,294,504, Cl. 339-132.00R.
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Sih, John C., to Upjohn Company, The. 13,14-Didehydro-19-oxo-PGF_2 compounds. 4,294,978, Cl. 562-503.000.
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Silberberg, Joseph, to Stauffer Chemical Company. Filled vinyl chloride polymer composition. 4,294,752, Cl. 260-42.140.
Silin, Evgeny L.: *See—*
Berenov, Alexandr D.; Krainev, Vladislav P.; Mansurov, Midkhat M.; Niskovskikh, Vitaly M.; and Silin, Evgeny L., 4,294,306, Cl. 164-448.000.
Simmons, Gerald P., to Caterpillar Tractor Co. Operator's station and mounting. 4,294,465, Cl. 280-756.000.
Simmons, John P., to Borg-Warner Corporation. Transmission shift control apparatus with countershaft brake. 4,294,338, Cl. 192-4.00A.
Simon Engineering Dudley Limited: *See—*
Ashworth, Denis H., 4,294,188, Cl. 118-305.000.
Simon-Johnson, Inc.: *See—*
McDonald, David M.; and Scheier, Donald J., 4,293,978, Cl. 17-12.000.
Simonsen, Michael G.: *See—*
Curry, Robert E.; and Simonsen, Michael G., 4,295,199, Cl. 364-555.000.
Sindlinger, Rainer; and Hammer, Josef, to Teldix GmbH. Magnetic bearing assembly. 4,294,493, Cl. 308-10.000.
Singer Company, The: *See—*
Herr, John A.; and Rogan, Bruce R., 4,295,118, Cl. 338-32.00H.
Skalina, Andrej: *See—*
Matta, Joseph J.; and Skalina, Andrej, 4,295,144, Cl. 343-895.000.
SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; Ernst, Horst M.; and Schulz, Toni, 4,294,100, Cl. 72-340.000.
Sloane, Thomas E., Jr.; Melius, Clair; and Kling, Erich, to United States Surgical Corporation. Self-contained filter assembly for removing air, particles and bacteria from a solution. 4,294,594, Cl. 55-186.000.
Small World Exchange, Inc.: *See—*
Johnson, Avery R.; McGurk, Richard G.; and Harrison, John M., 4,295,008, Cl. 179-18.0BC.
Smith, Benjamin F., Jr.: *See—*
Sequeira, Avilino, Jr.; Smith, Benjamin F., Jr.; and Mead, Theodore C., 4,294,689, Cl. 208-326.000.
Smith, Charles M. Crab butchering machine. 4,293,981, Cl. 17-71.000.
Smith, Clay D.; and Keller, Douglas V., Jr., to Standard Oil Company. Multi-phase separation methods and apparatus. 4,294,695, Cl. 210-173.000.
Smith, Franklin. Subsoil agricultural implement with rotatable disc. 4,294,181, Cl. 111-87.000.
Smith, Herman W., to Upjohn Company, The. Structural analogues of 5,6,-dihydro PG_1. 4,294,759, Cl. 260-326.270.
Smith International, Inc.: *See—*
Herd, David P., 4,294,284, Cl. 137-613.000.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,294,854, Cl. 424-326.000.
Smith, Michael P.: *See—*
Blackburn, Martin J.; and Smith, Michael P., 4,294,615, Cl. 75-175.500.
Smith, Richard W.: *See—*
Woelfel, James A.; and Smith, Richard W., 4,294,639, Cl. 156-185.000.
Smith, Robert A.: *See—*
Williams, John W.; Smith, Robert A.; and Arbir, Francis W., 4,294,853, Cl. 424-319.000.
Smith, Robert E.; and Bissell, Eugene R. Substrates and method for determining enzymes. 4,294,923, Cl. 435-23.000.
Smith, William H.: *See—*
Wilreker, Victor F.; and Smith, William H., 4,295,094, Cl. 324-96.000.
Snel, Cornelis; and Kuus, Albert. Haybox. 4,294,197, Cl. 119-60.000.
Snelling, Christopher, to Xerox Corporation. Multiple function reproduction apparatus. 4,294,534, Cl. 355-3.00R.
Snipes, Wallace: *See—*
Keith, Alec D.; and Snipes, Wallace, 4,294,820, Cl. 424-28.000.
Snow Brand Milk Products Co., Ltd.: *See—*
Kumazawa, Eitaro; Saiki, Yukihiro; and Ishioka, Yozo, 4,294,018, Cl. 34-56.000.
Snowden, Paul, to Imperial Chemical Industries, Inc. Spinning process and apparatus. 4,294,783, Cl. 264-8.000.

Snyder, Irving F.; and Luebeck, Duane A., to Graco Inc. In centrifugal spray guns. 4,294,408, Cl. 239-218.500.

Societa Italiana Vetro-Siv-S.p.A.: *See—*
Kalbskopf, Reinhard; and Baumberger, Otto, 4,294,868, Cl. 427-109.000.

Societa Italo-Britannica: *See—*
Innocenti, Franco; Orzalesi, Giovanni; and Volpato, Ivo, 4,294,833, Cl. 424-263.000.

Societe Anonyme dite: L'Oreal: *See—*
Vanlerberghe, Guy; Sebag, Henri; and Fiquet, Claire, 4,294,728, Cl. 252-542.000.

Societe Chimique des Charbonnages SA: *See—*
Couderc, Pierre; Grardel, Jean-Luc; and Caux, Gerard, 4,294,717, Cl. 252-97.000.

Societe de Paris et du Rhone: *See—*
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Societe d'Etudes Scientifiques et Industrielles de l'Ile de-France: *See—*
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Soldner, Richard E., to Siemens Aktiengesellschaft. Ultrasonic applicator for ultrasonic scanning of bodies. 4,294,119, Cl. 73-625.000.

Soles, Otto H.: *See—*
Kovatch, George N.; Bettencourt, George S.; and Soles, Otto H., 4,295,054, Cl. 307-80.000.

Solomons, Gerald L.; and Scammell, Gerald W., to Ranks Hovis McDougall Limited. Production of edible protein substances. 4,294,929, Cl. 435-254.000.

Sontheim, Max: *See—*
Paulsen, Ralf; Sontheim, Max; and Ullmann, Christoph, 4,294,056, Cl. 53-86.000.

Sony Corporation: *See—*
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Sopino, Bruno: *See—*
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno, 4,294,734, Cl. 260-22.0CB.
Corrado, Giovanni; Bertotti, Elvio; and Sopino, Bruno, 4,294,748, Cl. 260-22.0CB.

Souhrada, Frank: *See—*
Fisher, Ian P.; Woods, H. John; and Souhrada, Frank, 4,294,686, Cl. 208-56.000.

South African Inventions Development Corporation: *See—*
Scheffel, Herbert; von Gericke, Rowlen E.; and Viviers, Joseph A., 4,294,482, Cl. 295-34.000.

Southland Corporation, The: *See—*
Hughes, Graham K., 4,294,992, Cl. 568-632.000.

Sova, Alex W. Workpiece retainer. 4,294,443, Cl. 269-108.000.

Spaeth, Bernd: *See—*
Blum, Arnold; Geng, Hellmuth R.; Schulze-Schoelling, Hermann; and Spaeth, Bernd, 4,295,220, Cl. 371-61.000.

Spanier, Florence: *See—*
Spanier, Joseph; and Spanier, Florence, 4,294,308, Cl. 165-1.000.

Spanier, Joseph; and Spanier, Florence. Method and assembly for camouflaging at least one building. 4,294,308, Cl. 165-1.000.

Spatz, David M.; and Cross, Barrington, to American Cyanamid Co. Novel para-phenylalkoxy phenylurea and thiourea compounds and herbicidal use thereof. 4,294,986, Cl. 564-52.000.

Spaude, Alfons, to Schloemann-Siemag Aktiengesellschaft. Rolling mill train. 4,294,099, Cl. 72-234.000.

Spaulding, James G.: *See—*
McMichael, John; Kline, Ellis L.; and Spaulding, James G., 4,294,818, Cl. 424-12.000.

Specker, Manfred: *See—*
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Spehrley, Charles W., Jr., to Xerox Corporation. Document vacuum weir system. 4,294,539, Cl. 355-76.000.

Spellman, Gordon B.: *See—*
Lade, Robert W.; Spellman, Gordon B.; Jaskolski, Stanley V.; Schutten, Herman P.; and Jaeschke, James R., 4,295,058, Cl. 307-252.00A.

Spencer, John K.: *See—*
Naylor, Arthur V.; and Spencer, John K., 4,294,060, Cl. 53-506.000.

Spengler, Walter. Electrode arrangement with individually connectable and disconnectable electrodes. 4,295,178, Cl. 361-220.000.

Sperry Corporation: *See—*
Decoene, Frans J. G. C.; Hommez, Etienne R. O. C.; and Naaktgeboren, Adrianus, 4,294,346, Cl. 198-740.000.
Eibner, Jules A.; and Kanamuller, Franz X., 4,295,043, Cl. 250-227.000.
Seymour, Shaun A., 4,294,062, Cl. 56-102.000.

Sperry Rand Corporation: *See—*
Porcella, Brewster J., 4,295,192, Cl. 364-200.000.

Spitzner, Ernest, to Henkel Corporation. Benzothiazine 1,1-dioxides. 4,294,961, Cl. 544-49.000.

Sprecker, Mark A.; Hall, John B.; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Benzodioxanones and organoleptic uses thereof. 4,294,266, Cl. 131-277.000.

Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Process for augmenting or enhancing the aroma of perfumed article using alkyl cycloalkenyl carbinol. 4,294,708, Cl. 252-8.600.

Sprott, Kenneth J.; and Herterick, George M., to Dresser Industries, Inc. Anti-surge system for gases and other media. 4,294,113, Cl. 73-199.000.

Stacey, Eric J.; and Baker, Donal E., to Westinghouse Electric Corp. Bank selection in naturally commutated thyristor controlled static power converters. 4,295,190, Cl. 363-162.000.

Stackpole Corporation, The: *See—*
Nystrom, William A.; Lanzel, Leo C.; and Bauer, William A., 4,294,438, Cl. 266-280.000.

Stadler, Donald A.: *See—*
Furlette, James L.; and Stadler, Donald A., 4,294,347, Cl. 198-751.000.

Stadler, Peter: *See—*
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Stahan Corporation: *See—*
Stancil, Charles M., 4,294,157, Cl. 89-1.00G.

Stalberg, Nils G.: *See—*
Enser, Mats A.; Hallberg, Lars O.; and Stalberg, Nils G., 4,295,121, Cl. 340-146.3MA.

Stancil, Charles M., to Stahan Corporation. Projectile deployed cable weapons system. 4,294,157, Cl. 89-1.00G.

Standard Oil Company: *See—*
Bremer, Noel J.; and Dria, Dennis E., 4,294,722, Cl. 252-435.000.
Smith, Clay D.; and Keller, Douglas V., Jr., 4,294,695, Cl. 210-173.000.

Standex International GmbH, Firma: *See—*
Werthmann, Wilfried, 4,294,650, Cl. 156-660.000.

Stanley Works, The: *See—*
Whitehouse, Hugh L., 4,294,110, Cl. 73-862.230.

Stas Societe Technique d'Accessoires Specialises S.A.: *See—*
Archer, Jean-Francois, 4,294,479, Cl. 294-82.00R.

Stauber, Hans-Ulrich; and Eberle, Jurg, to Ferag AG. Universal joint-link chain. 4,294,345, Cl. 198-683.000.

Stauffer Chemical Company: *See—*
Silberberg, Joseph, 4,294,752, Cl. 260-42.140.
Wei, Chung H., 4,294,945, Cl. 526-74.000.

Stecher, Gunther: *See—*
Maurer, Helmut; Muller, Klaus; Linder, Ernst; Rieger, Franz; and Stecher, Gunther, 4,294,679, Cl. 204-195.00S.

Stedefeder, Joachim: *See—*
Hartmann, Juergen; Stedefeder, Joachim; Denzinger, Walter; and Pfohl, Sigberg, 4,294,873, Cl. 427-391.000.

Steelhammer, Joe C.: *See—*
Polizzotti, David M.; and Steelhammer, Joe C., 4,294,588, Cl. 55-5.000.

Steen, Adam; and Verhoog, Hendrik M., to Hoogovens Ijmuiden B.V. Method of providing and maintaining a wear-lining of a steel converter and a steel converter having such a lining. 4,294,431, Cl. 266-44.000.

Stefanska, Barbara: *See—*
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Trola, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

Steffes, Paul: *See—*
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Steigerwald, Robert L., to General Electric Company. High gain latching Darlington transistor. 4,295,059, Cl. 307-253.000.

Steinbrenner, Ulrich: *See—*
Hans, Waldmar; Sauer, Rudolf; Glockler, Otto; Steinbrenner, Ulrich; Gunther, Dieter; and Lembke, Manfred, 4,294,215, Cl. 123-470.000.

Stephen C. Small: *See—*
Woodford, Thomas J., 4,294,238, Cl. 128-80.00G.

Stephens, Donald E.; and Taylor, John T., to Beckman Instruments, Inc. Temperature regulating apparatus. 4,294,799, Cl. 422-62.000.

Stepin, Anatoly L.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,294,098, Cl. 72-128.000.

Sterling Drug Inc.: *See—*
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Lesher, George Y.; and Brundage, Ruth P., 4,294,836, Cl. 424-263.000.
Lesher, George Y.; Opalka, Chester J., Jr.; and Page, Donald F., 4,294,837, Cl. 424-263.000.
Margulies, Herman; and Kaufman, Richard H., 4,294,361, Cl. 206-532.000.

Sternberg, Ben K.; Miller, Dale E.; and Bahjat, Dhari S., to Conoco, Inc. Electrode prospecting method providing calculable electromagnetic coupling for the indirect detection of hydrocarbon reservoirs. 4,295,096, Cl. 324-357.000.

Stevens, John H.; and Reidel, Bruce A., to Kennecott Corporation. Pop up abrasive disc dispenser. 4,294,357, Cl. 206-409.000.

Stewart, Charles W., Sr.: *See—*
Anolick, Colin; Robinson, Vivian M.; and Stewart, Charles W., Sr., 4,294,489, Cl. 297-452.000.

Stewart, James W. Ice hole heater. 4,294,030, Cl. 43-4.000.

Stiebel Eltron GmbH & Co. KG: *See—*
Reusch, Heinz; and Kreikenbohm, Robert, 4,294,310, Cl. 165-104.130.

Stiftelsen Institute for Mikrovagsteknik vid Tekniska Hogskolan i Stockholm: *See—*
Henoch, Bengt; and Berglind, Eilert, 4,295,221, Cl. 375-23.000.

Stilwell, Robert E.; and Westerling, David E., to FMC Corporation. Bin filling apparatus and method. 4,294,059, Cl. 53-448.000.

Stimtech, Inc.: *See—*
Bussey, Joseph G., 4,294,245, Cl. 128-207.210.
Stock, Albert M.; and Verbsky, James D., to Du Pont de Nemours, E. I., and Company. Process for the control of pH in the ethynylation of formaldehyde. 4,294,997, Cl. 568-855.000.
Stockli, Andre; Castaneda, Fernando; and Stockli, Jean-Louis. Boots for aquatic activities. 4,294,022, Cl. 36-4.000.
Stockli, Jean-Louis: *See—*
Stockli, Andre; Castaneda, Fernando; and Stockli, Jean-Louis, 4,294,022, Cl. 36-4.000.
Stoddart, Barry: *See—*
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Stolecki, William E., to Electric Power Research Institute. Pipe coupling assembly especially suitable for use in the nuclear reactor. 4,294,472, Cl. 285-27.000.
Stoll, Kurt. Piston for use in pneumatically operated piston-cylinder apparatus. 4,294,164, Cl. 92-243.000.
Stolov, Michael. Image or picture projecting system using electronically controlled slides. 4,294,524, Cl. 353-84.000.
Stolz, Manfred: *See—*
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Stone, Frederick C.; and Schupska, Gary G., to Dow Chemical Company, The. Method for preparing α-picoline from 5-oxohexanenitrile. 4,294,968, Cl. 546-251.000.
Storz, Karl. Laryngoscope. 4,294,235, Cl. 128-11.000.
Stoss, Peter; Satzinger, Gerhard; Herrmann, Manfred; and Heldt, Wolfgang. Certain heterocyclic sulfoximide derivatives. 4,294,838, Cl. 424-263.000.
Stoutenburg, Donn V., to IRD Mechanalysis, Inc. Indicating apparatus, particularly for vibration analyzing equipment. 4,295,136, Cl. 340-753.000.
Straat, Patricia A.: *See—*
Levin, Gilbert V.; and Straat, Patricia A., 4,294,931, Cl. 435-301.000.
Strauss, Gary M., to Weyerhaeuser Company. Method and apparatus for counting small objects suspended in a liquid stream. 4,294,542, Cl. 356-339.000.
Straw, David A.: *See—*
Miller, Edward C.; and Straw, David A., 4,294,373, Cl. 220-70.000.
Strickler, Melvin D. Wood finger jointing apparatus. 4,294,647, Cl. 156-558.000.
Striebich, Helmut, to Dr. Ing. h.c. F. Porsche Aktiengesellschaft. Drive assembly, especially for motor vehicles. 4,294,074, Cl. 60-616.000.
Stritzl, Karl: *See—*
Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, 4,294,462, Cl. 280-634.000.
Stuckert, Paul E., to International Business Machines Corporation. Method and apparatus for achieving secure password verification. 4,295,039, Cl. 235-380.000.
Studlien, Vance D., to Bofors America, Inc. Pressure transducer. 4,295,116, Cl. 338-4.000.
Stumpp, Gerhard; and Wessel, Wolf, to Robert Bosch GmbH. Method and apparatus for correcting the fuel quantity in an internal combustion engine. 4,294,211, Cl. 123-379.000.
Stupell Industries, Ltd.: *See—*
Dorsen, Mac; and Saltzman, Philip A., 4,294,299, Cl. 150-28.00R.
Stutz, Hansruedi, to Gebruder Loepfe AG. Device for continuously measuring a transverse dimension of a thread-like structure. 4,294,545, Cl. 356-386.000.
Su, Tien-Kuei, to Milliken Research Corporation. Shapeable thermoplastic resin composition containing cyclic acetal. 4,294,747, Cl. 260-37.00R.
Subh, Naif T.: *See—*
Daugherty, Edgar E.; Jackson, Kenneth W.; Jones, Wesley W.; and Subh, Naif T., 4,295,005, Cl. 174-92.000.
Sugahara, Hiroshi: *See—*
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Sugahara, Syunji; and Morimoto, Takao, to Matsushita Electric Industrial Company, Limited. Automatic screwdriver. 4,294,142, Cl. 81-57.370.
Sugano, Kazuhiko: *See—*
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Sugawara, Noboru: *See—*
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Sugita, Toshio; Sakaguchi, Hiroaki; Tsuda, Hisanobu; and Suzuki, Tsuyoshi, to Mitsui-Nisso Corporation. Rapid curing polyurethane elastomer prepared from a diphenylmethanediisocyanate based liquid prepolymer and a curing agent containing a polytetramethylene ether glycol, a diol and an organometallic catalyst. 4,294,951, Cl. 528-55.000.
Sugiura, Muneharu; and Sagara, Seiji, to Canon Kabushiki Kaisha. Slit illuminating device. 4,295,186, Cl. 362-217.000.
Sukonick, Josef. Alignable electronic background grid generation system. 4,295,135, Cl. 340-734.000.
Sullivan, Marc L.: *See—*
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Sumitomo Chemical Company, Limited: *See—*
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Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
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Sumitomo Naugatuck Co., Ltd.: *See—*
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Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, to Aisan Industry Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supplying device for use in fuel injection type internal combustion engine. 4,294,213, Cl. 123-454.000.
Summerhays, Brent: *See—*
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Summers, Kenneth L.; and Rieke, Mahlon E., to Riche Corporation. Container closure device. 4,294,382, Cl. 222-529.000.
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Sun Oil Company of Pennsylvania: *See—*
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Sun Yao, Huei Y.: *See—*
Yao, Shang J.; Sun Yao, Huei Y.; and Wolfson, Sidney K., Jr., 4,294,891, Cl. 429-2.000.
Suncor Inc.: *See—*
Morgan, George W., 4,294,183, Cl. 114-42.000.
Sunden, Olof, to EKA AB. Surface-modified pigment of natural kaolin material and a process of producing same. 4,294,885, Cl. 428-404.000.
Sung, Rodney L., to Texaco Inc. Novel fuel composition for internal combustion engine. 4,294,585, Cl. 44-53.000.
Sunstein, Drew E. Programmable correlator. 4,295,204, Cl. 364-824.000.
Superior Electric Company, The: *See—*
Leenhouts, Albert C., 4,295,083, Cl. 318-696.000.
Suppa, Vito; and Viallet, Daniel, to Thomson-CSF. Inertially released jettisonable airborne buoy. 4,295,211, Cl. 367-4.000.
Sutter, David L., to Hussey Manufacturing Co., Inc. Apparatus for supporting pivotally mounted seats. 4,294,048, Cl. 52-9.000.
Suzuki, Hidetsugu: *See—*
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Suzuki, Katsunori: *See—*
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Suzuki, Tsuyoshi: *See—*
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Svenska Kassaregister AB: *See—*
Mattsson, Mats E., 4,294,554, Cl. 400-320.000.
Svoboda, Josef; Krob, Erwin; and Weigl, Erwin, to TMC Corporation. Ski brake. 4,294,459, Cl. 280-605.000.
Svoboda, Josef; Wuerthner, Herbert; and Stritzl, Karl, to TMC Corporation. Spring locking device. 4,294,462, Cl. 280-634.000.
Swart, Petrus H. Gear ratio selection apparatus. 4,294,341, Cl. 192-0.073.
Swartz, Robert V. Internal combustion engines. 4,294,201, Cl. 123-73.00R.
Sweetheart Plastics, Inc.: *See—*
Davis, Paul, 4,294,371, Cl. 220-4.00E.
Swenson, Richard C., to United States of America, Navy. Linear acoustic array. 4,295,212, Cl. 367-20.000.
Syntex (U.S.A.) Inc.: *See—*
Harris, George S., 4,294,844, Cl. 424-273.00R.
Szeliga, Philip C., to Foam Controls, Inc. Flow control apparatus. 4,294,277, Cl. 137-101.190.
Szente, Andre: *See—*
Fischli, Albert E.; and Szente, Andre, 4,294,758, Cl. 260-239.30D.
Szvoboda, Gyorgy: *See—*
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.
Szyszkowski, Adam; Moreau, Marc; and Priester, Pierre, to Trefimetaux. Drawn rods made of lead brass and a process for the thermal treatment thereof. 4,294,629, Cl. 148-11.50C.
T/Drill, Inc.: *See—*
Kemme, Wendell J., 4,294,011, Cl. 30-106.000.
Tabata, Yoneho: *See—*
Matsuda, Osamu; Watanabe, Terutaka; Tabata, Yoneho; and Machi, Sueo, 4,294,675, Cl. 204-159.140.

Taboada, John: *See*—
Altschuler, Bruce R.; Taboada, John; and Altschuler, Martin D., 4,294,544, Cl. 356-376.000.

Tachikara Kabushiki Kaisha: *See*—
Takazawa, Kazuyasu, 4,294,793, Cl. 264-311.000.

Tadewald, Thomas D., to UOP Inc. Heater assembly and method of forming same. 4,294,643, Cl. 156-293.000.

Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, to Tokuyama Soda Kabushiki Kaisha. Alkali calcium silicates and process for preparation thereof. 4,294,810, Cl. 423-331.000.

Taguchi, Yoshinobu: *See*—
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Tai-Her, Yang. Audio-visual disaster alert system. 4,295,130, Cl. 340-524.000.

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Kubota, Michio; Takagi, Kazuhiro; and Mitani, Yorimasa, 4,294,632, Cl. 148-142.000.

Takago, Toshio; Arai, Masatoshi; and Futatsumori, Koji, to Shin-Etsu Chemical Co. Ltd. Hydroalkenyloxysilanes. 4,294,975, Cl. 556-482.000.

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Takahashi, Fumitake: *See*—
Ashida, Hiroshi; and Takahashi, Fumitake, 4,294,189, Cl. 118-603.000.

Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, to Hitachi, Ltd. Semiconductor absolute pressure transducer assembly and method. 4,295,115, Cl. 338-4.000.

Takahashi, Nagashige, to Kabushiki Kaisha Medos Kenkyusho. Slack absorbing device for an endoscope. 4,294,233, Cl. 128-4.000.

Takahashi, Sankichi: *See*—
Sawa, Toshio; Kubota, Masayoshi; Takahashi, Sankichi; and Kaneko, Toyohiko, 4,294,697, Cl. 210-221.100.

Takahashi, Susumu, to Kanto Yakin Kogyo Kabushiki Kaisha. Furnace with protective atmosphere for heating metals. 4,294,436, Cl. 266-257.000.

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Takahashi, Yuu, to Aida Engineering, Ltd. Roll feed device for feeding material to a press. 4,294,170, Cl. 100-216.000.

Takahisa, Shuji; Suzuki, Osamu; and Shibano, Michio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for doffing and donning bobbins in a spinning machine. 4,294,067, Cl. 57-274.000.

Takasaki, Toshio: *See*—
Kanai, Isamu; Okubo, Shigeki; Tsuchiya, Kazuo; and Takasaki, Toshio, 4,294,475, Cl. 285-165.000.

Takase, Yosio: *See*—
Kashima, Isoo; Mishina, Masami; Takase, Yosio; and Maruchi, Katsumi, 4,295,017, Cl. 200-47.000.

Takashima, Yuji; Ishida, Eisuke; Nishiguchi, Hisanori; and Yoshino, Kimiaki, to Matsushita Electric Industrial Co., Ltd. Image formation method having translucent particles containing a coloring agent and a colorless dye former. 4,294,902, Cl. 430-45.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,294,960, Cl. 544-22.000.

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Takeda Chemical Industries, Ltd: *See*—
Asai, Mitsuko, 4,294,757, Cl. 260-239.30P.

Takeda, George: *See*—
Ideta, Yasufumi; Takeda, George; and Watanabe, Shoei, 4,294,160, Cl. 91-378.000.

Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Circuit for generating scanning pulses. 4,295,055, Cl. 307-221.00C.

Takeuchi, Shigeo. Apparatus for mixing and baking of bread. 4,294,166, Cl. 99-348.000.

Takeuchi, Yoko: *See*—
Takahara, Yoshiyuki; Hirose, Yoshiteru; Takeuchi, Yoko; Murai, Asao; Kainosho, Masatsune; and Murao, Sawao, 4,294,754, Cl. 260-112.50R.

Takeuchi, Yoshiyuki: *See*—
Enomoto, Minoru; Yoneda, Takoao; and Takeuchi, Yoshiyuki, 4,294,045, Cl. 51-165.710.

Takeuchi, Yuzo: *See*—
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.

Takezhanov, Sauk T.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Takita, Hitoshi; Mukaida, Yutaka; and Enomoto, Satoru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for preparing a normal long chain alkanoic acid. 4,294,770, Cl. 260-413.000.

Tallon, Jacques: *See*—
Gevaud, Roland; and Tallon, Jacques, 4,294,106, Cl. 73-40.700.

Tamas, Istvan; Tamas, Lajos; Kiss, Gyula; Kiss, Jozsef; and Kaldor, Antal, to Vasipari Kutato Intezet. Process and apparatus for reducing the inclusion content of steels and for refining their structure. 4,294,611, Cl. 75-49.000.

Tamas, Lajos: *See*—
Tamas, Istvan; Tamas, Lajos; Kiss, Gyula; Kiss, Jozsef; and Kaldor, Antal, 4,294,611, Cl. 75-49.000.

Tameo, Robert P., to United States of America, Navy. Turbomachine balance correction system. 4,294,135, Cl. 74-573.00R.

Tamiya, Katsunori: *See*—
Kimoto, Yasuo; Tamiya, Katsunori; Honda, Shoichi; Maehata, Hidehiko; and Kamada, Hiroshi, 4,294,673, Cl. 204-129.460.

Tamm, Rolf: *See*—
Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, 4,294,126, Cl. 73-864.210.

Tamony, Andree E.; and Youngson, Charles R., Jr., to Dow Chemical Company, The. Denitrification of a gas stream. 4,294,928, Cl. 423-235.000.

Tamura, Shoichi: *See*—
Abe, Kazunobu; Tamura, Shoichi; and Nakatsuji, Tadao, 4,294,806, Cl. 423-239.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Yoneda, Naoto; Kato, Jyoji; and Kinashi, Keizo, 4,294,832, Cl. 424-258.000.

Tanabe, Takeshi, to Sharp Kabushiki Kaisha. Combination of gas sensor controlled cooking utensil and gas leak alarm. 4,295,028, Cl. 219-10.55B.

Tanaka, Mitsuaki; and Suzuki, Hidetsugu, to Victor Company of Japan, Limited. Speaker system. 4,295,006, Cl. 179-1.00E.

Tanaka, Shigeho: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Tanaka, Shuhei: *See*—
Takemoto, Iwao; Koike, Norio; Ohba, Shinya; Ando, Haruhisa; Nakai, Masaaki; Hanamura, Syoji; Izawa, Ryuichi; Kubo, Masaharu; Aoki, Masakazu; and Tanaka, Shuhei, 4,295,055, Cl. 307-221.00C.

Tanigami, Takahiko: *See*—
Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, 4,295,115, Cl. 338-4.000.

Taniguchi, Eiji; Akagi, Susumu; and Torimitsu, Seiichi, to Toray Industries, Inc. Coating composition. 4,294,939, Cl. 525-118.000.

Tanihara, Yoshiaki: *See*—
Nouda, Hiroshi; Tanihara, Yoshiaki; Ikeda, Takashi; and Ogiuchi, Ituo, 4,294,791, Cl. 264-210.200.

Tanner, Robert M., to University of California, Regents of the. Error-correcting coding system. 4,295,218, Cl. 371-40.000.

Taricco, Stefano, to Centro Ricerche Fiat S.p.A. Process for the reduction of iron oxide. 4,294,609, Cl. 75-34.000.

Taverez, Dan. Air-filter apparatus in combination with a turbine engine. 4,294,596, Cl. 55-242.000.

Tavlarides, Lawrence L.; Freeman, Robert W.; and Hsia, Alexander M. Liquid jet recycle reactor. 4,294,800, Cl. 422-68.000.

Taylor, John T.: *See*—
Stephens, Donald E.; and Taylor, John T., 4,294,799, Cl. 422-62.000.

Taylor, Lloyd D.: *See*—
Bronstein-Bonte, Irena Y.; Lindholm, Edward P.; and Taylor, Lloyd D., 4,294,907, Cl. 430-213.000.

TBA Industrial Products Limited: *See*—
Thornley, Harry, 4,294,790, Cl. 264-171.000.

Teige, Wolfgang: *See*—
Papenfuhs, Theodor; and Teige, Wolfgang, 4,294,749, Cl. 260-40.00P.

Teijin Limited: *See*—
Nouda, Hiroshi; Tanihara, Yoshiaki; Ikeda, Takashi; and Ogiuchi, Ituo, 4,294,791, Cl. 264-210.200.
Suzuki, Yoshiki; Ikura, Hiroshi; Yamashita, Gentaro; and Nagai, Tsuneji, 4,294,829, Cl. 424-241.000.

Teissier, Jacques. Suction gripping device. 4,294,424, Cl. 248-362.000.

Tekma Kinomat S.p.A.: *See*—
Camardella, Giuseppe, 4,294,417, Cl. 242-149.000.

Teldix GmbH: *See*—
Sindlinger, Rainer; and Hammer, Josef, 4,294,493, Cl. 308-10.000.

Telecommunications Radioelectriques et Telephoniques: *See*—
Van Uffelen, Jean-Pierre H., 4,295,222, Cl. 375-106.000.

Teledyne Industries, Inc.: *See*—
Kotecki, Damian J., 4,294,614, Cl. 75-128.00A.

Telemetry Controls, Inc.: *See*—
Wilson, Worley C., 4,295,191, Cl. 364-104.000.

Tencza, Thomas M., to Bristol-Myers Company. Alkaline analgesic capsule. 4,294,819, Cl. 424-14.000.

Tennigkeit, Jurgen: *See*—
Lorenz, Heribert; and Tennigkeit, Jurgen, 4,294,293, Cl. 141-100.000.

Tennyson, Richard P., to Munters Corporation. Method for operating a coke quench tower scrubber system. 4,294,663, Cl. 201-39.000.

Terada, Soichiro: *See*—
Ikeda, Tatsuhiko; and Terada, Soichiro, 4,294,707, Cl. 210-782.000.

Terumo Corporation: *See*—
Ikeda, Tatsuhiko; and Terada, Soichiro, 4,294,707, Cl. 210-782.000.

Terzian, Rouben T., to Marvin Glass & Associates. Animated talking doll. 4,294,033, Cl. 46-118.000.

Teshima, Hiroshi: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Tetra Pak International AB: *See*—
Martensson, Kjell H., 4,294,362, Cl. 206-622.000.

Tetsuo, Tanaka: *See*—
Issei, Katsuta; and Tetsuo, Tanaka, 4,294,665, Cl. 203-50.000.

Tevopharm-Schiedam B.V.: *See*—
van Maanen, Johannes D., 4,294,344, Cl. 198-461.000.

Texaco, Inc.: *See*—
Sequeira, Avilino, Jr.; Smith, Benjamin F., Jr.; and Mead, Theodore C., 4,294,689, Cl. 208-326.000.
Sung, Rodney L., 4,294,585, Cl. 44-53.000.

Texas Instruments Incorporated: *See*—
Chang, Richard R.; Frantz, Gene A.; and Hawkins, William R., 4,295,181, Cl. 361-395.000.
Gottbreht, Tom L.; and Shepherd, Glen C., 4,293,987, Cl. 29-25.420.
Kuo, Chang-Kiang, 4,294,001, Cl. 29-571.000.
Schmidt, Gary D.; Norris, Jerry L.; and Weirauch, Donald F., 4,295,102, Cl. 331-65.000.

Textron, Inc.: *See*—
Moertel, George B., 4,293,994, Cl. 29-409.000.

Thatcher, Gordon: *See*—
Humphreys, Peter; Davidson, Daniel F.; and Thatcher, Gordon, 4,294,658, Cl. 376-404.000.

Thayer, Paul M., to Water Pollution Control Corporation. Swing diffuser. 4,294,696, Cl. 210-220.000.

Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft: *See*—
Mayer, Harald; and Berentzen, Hardo, 4,294,086, Cl. 66-121.000.

Thettu, Raghulinga R., to Xerox Corporation. Document belt vacuum manifold. 4,294,540, Cl. 355-76.000.

Theurer, Josef; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machines for removing surface irregularities from rail heads. 4,294,041, Cl. 51-5.00C.

Thiboutot, Robert, to Les Entreprises Rotot Ltee. Collapsible support device for a folding sled. 4,294,457, Cl. 280-20.000.

Thiere, Helmuth; and Vallentin, Werner, to Siemens Aktiengesellschaft. Corrugated horn radiator. 4,295,142, Cl. 343-781.0CA.

Thill, Gary A., to Minnesota Mining and Manufacturing Company. Perforated closed cell padding material. 4,294,240, Cl. 128-156.000.

Thir, Basil: *See*—
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,294,944, Cl. 525-423.000.

Thomas & Betts Corporation: *See*—
Logan, Maurus C., 4,294,512, Cl. 350-96.200.

Thomas C. Elder, Inc.: *See*—
Kaufman, Kurt D., 4,294,822, Cl. 424-59.000.
Kaufman, Kurt D., 4,294,847, Cl. 424-279.000.

Thomas, Richard C.; Pegler, Stewart M.; and Cordes, Paul B., to British Gas Corporation. Apparatus and method for detecting the location of metallic objects having alternating current passing therethrough. 4,295,095, Cl. 324-326.000.

Thomas, Rudolf: *See*—
Schmidt, Robert R.; and Thomas, Rudolf, 4,294,607, Cl. 71-92.000.

Thomasson, Harry V.: *See*—
Kunstlicher, Erich; and Thomasson, Harry V., 4,294,421, Cl. 248-37.600.

Thome, Roland: *See*—
Kruger, Jorg; Thome, Roland; Moritz, Dieter; Bings, Hubert; and Losert, Herbert, 4,294,816, Cl. 423-484.000.

Thominet, Michel; Acher, Jacques; and Monier, Jean-Claude, to Societe d'Etudes Scientifiques et Industrielles de l'Ile de-France. New derivatives of 4-amino-5-alkyl sulphonyl orthoanisamides, methods of preparing them and their application as psychotropic agents. 4,294,828, Cl. 424-232.000.

Thompson, Arthur H.; and Ballester, Ricardo H., to Thompson, Arthur H. Battery capacity measuring method and apparatus. 4,295,097, Cl. 324-429.000.

Thompson, Charles W.: *See*—
Gerboth, Patrick L.; and Thompson, Charles W., 4,294,082, Cl. 62-244.000.

Thompson, David A.: *See*—
Romankiw, Lubomyr T.; and Thompson, David A., 4,295,173, Cl. 360-125.000.

Thompson, John P.: *See*—
Mosse, Barbara; and Thompson, John P., 4,294,037, Cl. 47-59.000.

Thompson, Morice: *See*—
Bentley, John; and Thompson, Morice, 4,294,735, Cl. 260-22.0CB.

Thompson, Raymond V.; Todd, Alan; and Constantine, Albert B., to Dynatrol Consultants (U.K.) Limited. Mixing apparatus. 4,294,549, Cl. 366-164.000.

Thompson, Robert B., to Rockwell International Corporation. Ultrasonic shear wave transducer. 4,295,214, Cl. 367-140.000.

Thomson-CSF: *See*—
Chehovah, Felix, 4,294,551, Cl. 400-119.000.
Suppa, Vito; and Viallet, Daniel, 4,295,211, Cl. 367-4.000.

Thornley, Harry, to TBA Industrial Products Limited. Manufacture of sheet material. 4,294,790, Cl. 264-171.000.

Thuries, Edmond; Vernat, Pierre; and Sauvat, Roger, to Delle-Alsthom. Gas-blast circuit-breaker. 4,295,023, Cl. 200-148.00R.

Timberlake, John F.: *See*—
Henson, Thomas R.; and Timberlake, John F., 4,294,774, Cl. 260-453.00P.

Time Commercial Financing Corporation: *See*—
Kimball, Charles A.; and Sullivan, Marc L., 4,294,324, Cl. 180-89.140.

Times Fiber Communications, Inc.: *See*—
Dabby, Franklin W.; and Chesler, Ronald B., 4,294,601, Cl. 65-3.120.

Timex Corporation: *See*—
Jakubek, John, 4,294,517, Cl. 350-345.000.

TMC Corporation: *See*—
Svoboda, Josef; Krob, Erwin; and Weigl, Erwin, 4,294,459, Cl. 280-605.000.
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Toben, Bernhard: *See*—
Doerk, Klaus; Koch, Klaus; Banke, Horst; and Toben, Bernhard, 4,294,947, Cl. 526-119.000.

Tobler, Hans; Fory, Werner; and Schurter, Rolf, to Ciba-Geigy Corporation. Novel N-phenyl-substituted N-heterocyclic compounds, their preparation and use in agents for regulating plant growth. 4,294,606, Cl. 71-88.000.

Toda, Hideo: *See*—
Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, 4,294,933, Cl. 521-27.000.

Todd, Alan: *See*—
Thompson, Raymond V.; Todd, Alan; and Constantine, Albert B., 4,294,549, Cl. 366-164.000.

Todokoro, Hideo; and Sakitani, Yoshio, to Hitachi, Ltd. Field emission electron gun with anode heater and plural exhausts. 4,295,072, Cl. 313-7.000.

Todt, Gerhard H., to Buro Patent A.G. Vehicle system with speed-responsive stop. 4,294,174, Cl. 104-250.000.

Toeppen, Thurston H. Threaded closure and container. 4,294,370, Cl. 215-329.000.

Tokai Regional Fisheries Research Laboratory: *See*—
Kinumaki, Toyosuke; Watanabe, Takehiko; Sugii, Kisaburo; and Iseki, Shigeo, 4,294,856, Cl. 426-7.000.

Tokico Ltd.: *See*—
Amemori, Hiroyuki; and Yamada, Masao, 4,294,123, Cl. 73-861.920.

Tokita, Taketoshi: *See*—
Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, 4,294,933, Cl. 521-27.000.

Tokoda, Saburo; Okumura, Koichiro; and Sugimoto, Eiji, to Nippon Electric Co., Ltd. Latch circuit. 4,295,061, Cl. 307-279.000.

Tokuyama Soda Kabushiki Kaisha: *See*—
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,294,943, Cl. 525-358.000.
Taga, Genji; Oikawa, Teruo; and Watanabe, Yoshiaki, 4,294,810, Cl. 423-331.000.

Tokyo Denki Kogaku Kogyo Kabushiki Kaisha: *See*—
Takahashi, Tetsuo; Taguchi, Yoshinobu; Harigane, Kotaro; Ito, Tetsuro; and Kato, Akihiro, 4,294,000, Cl. 29-564.600.

Tokyo Electric Co., Ltd.: *See*—
Nishiyama, Yoshihisa, 4,294,322, Cl. 177-210.00R.

Tokyo Sanyo Electric: *See*—
Yoshii, Kazuhiro, 4,294,076, Cl. 62-235.100.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Mitani, Akio; Sakamoto, Moriyoshi; and Murasaki, Hiroaki, 4,294,081, Cl. 62-140.000.
Otsuka, Kenichi; and Hosokawa, Yorio, 4,295,079, Cl. 315-130.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Zushi, Sadao; and Oida, Yoshio, 4,295,027, Cl. 219-10.55B.

Tokyo Yogyo Kabushiki Kaisha: *See*—
Sawada, Hajimu; and Inubushi, Hisao, 4,294,437, Cl. 266-272.000.

Tom, Milton D. Apparatus for producing and dispensing detergent solutions. 4,294,280, Cl. 137-268.000.

Tomcavage, Joseph R.: *See*—
Carter, Don R.; Doner, Claude E.; Hammersand, Fred G.; and Tomcavage, Joseph R., 4,295,077, Cl. 313-293.000.

Tominaga, Tamotsu: *See*—
Toriumi, Takeshi; and Tominaga, Tamotsu, 4,294,390, Cl. 226-181.000.

Tomoff, Toma; Chlosta, Wolfgang; Henninger, Heinz; Tamm, Rolf; and Grossmann, Klaus, to Bodenseewerk Perkin-Elmer & Co., GmbH. Sample feeding device. 4,294,126, Cl. 73-864.210.

Tomoff, Toma, to Bodenseewerk Perkin-Elmer & Co., GmbH. Automatic sample feeder for flameless atomic absorption spectrometer. 4,294,127, Cl. 73-864.210.

Tomogane, Teruhisa: *See*—
Ueno, Toshihiko; and Tomogane, Teruhisa, 4,294,712, Cl. 252-12.000.

Tomuro, Jinichi: *See—*
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

Toray Industries, Inc.: *See—*
Taniguchi, Eiji; Akagi, Susumu; and Torimitsu, Seiichi, 4,294,939, Cl. 525-118.000.

Tordella, Joseph R. Van platform with lockable ramp. 4,294,571, Cl. 414-537.000.

Torimitsu, Seiichi: *See—*
Taniguchi, Eiji; Akagi, Susumu; and Torimitsu, Seiichi, 4,294,939, Cl. 525-118.000.

Toriumi, Takeshi; and Tominaga, Tamotsu, to Hitachi Denshi Kabushiki Kaisha. Pinch roller mechanism. 4,294,390, Cl. 226-181.000.

Toro Company, The: *See—*
Granger, Bruce A.; and Klis, David S., 4,294,339, Cl. 192-12.0BA.

Torok, Istvan: *See—*
Alfoldi, Lajos; Balint nee Fodor, Katalin; Kari, Csaba; Torok, Istvan; Szvoboda, Gyorgy; Lang, Tibor; Gado, Istvan; and Ambrus, Gabor, 4,294,927, Cl. 435-172.000.

Totman, Mirrel L., to Totman Seal Nut, Inc. Flanged joint sealing nut. 4,294,275, Cl. 137-15.000.

Totman Seal Nut, Inc.: *See—*
Totman, Mirrel L., 4,294,275, Cl. 137-15.000.

Tottori Sanyo Electric Co., Ltd.: *See—*
Iwata, Mitsuo; Wada, Hajime; Iwasa, Tomoyuki; and Tsuchino, Kunio, 4,295,169, Cl. 360-71.000.

Towae, Friedrich: *See—*
Merger, Franz; and Towae, Friedrich, 4,294,971, Cl. 548-226.000.

Toyo Rubber Industry Co., Ltd., The: *See—*
Nishida, Masazo, 4,294,880, Cl. 428-315.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Enomoto, Minoru; Yoneda, Takoao; and Takeuchi, Yoshiyuki, 4,294,045, Cl. 51-165.710.

Toyota, Akinori; Yoshitugu, Ken; and Kashiwa, Norio, to Mitsui Petrochemical Industries Ltd. Process for preparing olefin polymers or copolymers, and catalyst for use in said process. 4,294,948, Cl. 526-125.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Aoki, Kenji, 4,294,212, Cl. 123-440.000.
Kinaga, Eiichi; and Mori, Mamoru, 4,294,468, Cl. 280-807.000.
Mori, Keiji; and Kurimoto, Kyoichi, 4,294,134, Cl. 74-547.000.
Ohumi, Takeharu, 4,294,286, Cl. 137-625.480.
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.
Ueda, Masahiro, 4,294,896, Cl. 429-86.000.

Tractel S.A.: *See—*
Desplats, Andre, 4,294,429, Cl. 254-272.000.

Tracy, David J.; Wood, Lindley S.; and Chakrabarti, Paritosh M., to GAF Corporation. Thiocyano-containing polyoxyalkylenes. 4,294,848, Cl. 424-302.000.

Trautner, Johann G., to Bentley Alemannia Limited. Flat bed knitting machines. 4,294,085, Cl. 66-75.100.

Trefimetaux: *See—*
Szyszkowski, Adam; Moreau, Marc; and Priester, Pierre, 4,294,629, Cl. 148-11.50C.

Treible, Edwin S.; Dopkin, Joseph A.; and Alford, Raymond N., to Ingersoll-Rand Co. Engine combustion control system. 4,294,214, Cl. 123-458.000.

Trico Products Corporation: *See—*
Gowans, Neil A.; and Riester, William C., 4,293,974, Cl. 15-250.320.

Trofimov, Oleg F.: *See—*
Egorov, Viktor P.; Ognevsky, Viktor A.; Orlovsky, Anatoly G.; Ostrovsky, Grigory A.; Ryskind, Alexandr M.; Stepin, Anatoly L.; Trofimov, Oleg F.; and Shklyarov, Isaak N., 4,294,098, Cl. 72-128.000.

Troka, Elzbieta: *See—*
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

Truesdell, Raymond L.; and Ross, Michael D., to RCA Corporation. Apparatus for measuring the characteristics of a wideband electromechanical recording system having a transformer. 4,295,216, Cl. 369-55.000.

Trutzschler GmbH & Co. KG: *See—*
Marx, Herr J., 4,293,982, Cl. 19-80.00A.

Tsuchino, Kunio: *See—*
Iwata, Mitsuo; Wada, Hajime; Iwasa, Tomoyuki; and Tsuchino, Kunio, 4,295,169, Cl. 360-71.000.

Tsuchiya, Kazuo: *See—*
Kanai, Isamu; Okubo, Shigeki; Tsuchiya, Kazuo; and Takasaki, Toshio, 4,294,475, Cl. 285-165.000.

Tsuda, Hisanobu: *See—*
Sugita, Toshio; Sakaguchi, Hiroaki; Tsuda, Hisanobu; and Suzuki, Tsuyoshi, 4,294,951, Cl. 528-55.000.

Tsui, Kwok W., to Arco Industries Ltd. Toy cash register. 4,295,036, Cl. 235-1.00E.

Tsuji, Kiyoshi: *See—*
Takaya, Takao; Takasugi, Hisashi; Chiba, Toshiyuki; and Tsuji, Kiyoshi, 4,294,960, Cl. 544-22.000.

Tsuji, Sadahiko: *See—*
Sato, Yasuhisa; Tsuji, Sadahiko; and Ishikawa, Kazuo, 4,294,529, Cl. 354-53.000.

Tsujino, Nobuyuki; and Hirano, Shigeo, to Fuji Photo Film Co., Ltd. Direct positive silver halide light-sensitive material. 4,294,919, Cl. 430-559.000.

Tucker, Alfred D., to Reed Irrigation Systems Pty Ltd. In-line tube junctions. 4,294,470, Cl. 285-5.000.

Tuell Industries, Inc.: *See—*
Tuell, James L.; and Wahnschaff, Paul, 4,294,456, Cl. 280-11.280.

Tuell, James L.; and Wahnschaff, Paul, to Tuell Industries, Inc. Pivotable ball skate. 4,294,456, Cl. 280-11.280.

Tull, Roger J.; Weinstock, Leonard M.; and Shinkai, Ichiro, to Merck & Co., Inc. Method of preparing 2,4-difluoroaniline. 4,294,988, Cl. 564-417.000.

Turley, Patricia A.: *See—*
Capuano, Italo A.; Turley, Patricia A.; and DuBord, Edward W., 4,294,798, Cl. 422-62.000.

Turnbull, James O.; Barker, John C.; and Knight, Arthur J., to J. J. Barker Company Limited. Method and apparatus for curing of articles. 4,294,021, Cl. 34-224.000.

Turner, James, to CBS Inc. Electronic musical instrument. 4,294,155, Cl. 84-1.010.

Turner, Rex H., to International Paper Company. Delignification and bleaching of lignocellulosic pulp via photo-oxygenation. 4,294,654, Cl. 162-50.000.

Tuscan Industries Pty. Limited: *See—*
Gell, Peter L., 4,294,418, Cl. 242-197.000.

Uba, Toshio, to Gates Rubber Company, The. Battery strap connection welding method. 4,295,029, Cl. 219-75.000.

UBE Industries, Ltd.: *See—*
Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, 4,294,976, Cl. 560-76.000.

Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, to Hitachi, Ltd.; and Nippon Mining Co., Ltd. Apparatus for preventing coking in fluidized bed reactor for cracking heavy hydrocarbon oil. 4,294,803, Cl. 422-111.000.

Uchiyama, Hirofumi: *See—*
Ifuku, Yasushi; Uchiyama, Hirofumi; and Hayashi, Masayuki, 4,294,861, Cl. 426-475.000.

Uchiyama, Kaoru: *See—*
Takahashi, Minoru; Tanigami, Takahiko; Uchiyama, Kaoru; Minorikawa, Hitoshi; Nishihara, Motohisa; Kawakami, Kanji; Suzuki, Seiko; Hachino, Hiroaki; and Misawa, Yutaka, 4,295,115, Cl. 338-4.000.

Ueda, Masahiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Battery with flame intercepting filter and grounding lead. 4,294,896, Cl. 429-86.000.

Uede, Hisashi: *See—*
Nakauchi, Hiroshi; Koyanagi, Katubumi; Inami, Yasuhiko; and Uede, Hisashi, 4,295,138, Cl. 340-785.000.

Uedono, Norio: *See—*
Kakihara, Naomichi; Harada, Yoshiaki; and Uedono, Norio, 4,294,706, Cl. 210-762.000.

Uemura, Kazuo: *See—*
Koga, Kenichiro; Hirose, Yoshiharu; Kanno, Iwao; Uemura, Kazuo; and Miura, Shuichi, 4,295,047, Cl. 250-363.00S.

Ueno, Toshihiko; and Tomogane, Teruhisa, to Bando Chemical Industries, Ltd. Self-lubricating bearing. 4,294,712, Cl. 252-12.000.

Uesaka, Tatsuo; Sugahara, Hiroshi; and Fujimura, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Adjusting device for color cathode ray tube. 4,295,110, Cl. 335-212.000.

Ugon, Michel, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Device for the protection of access to a permanent memory of a portable data carrier. 4,295,041, Cl. 234-487.000.

Uhl, Wyman F.: *See—*
Antonio, Christo; and Uhl, Wyman F., 4,294,888, Cl. 428-451.000.

Ullmann, Christoph: *See—*
Paulsen, Ralf; Sontheim, Max; and Ullmann, Christoph, 4,294,056, Cl. 53-86.000.

Umarov, Almas B.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Umeda, Kaoru: *See—*
Nishimura, Yoshinori; Umeda, Kaoru; and Harada, Hideo, 4,295,224, Cl. 455-156.000.

Union Carbide Corporation: *See—*
Berger, Mitchell H.; Gill, Peter J.; and Maresca, Louis M., 4,294,956, Cl. 528-179.000.
Berger, Mitchell H.; Maresca, Louis M.; and Matzner, Markus, 4,294,957, Cl. 528-179.000.
Blair, Eskel B.; and Koleske, Joseph V., 4,294,746, Cl. 260-37.0EP.
Gardner, Hugh C., 4,294,751, Cl. 260-400.00R.

Union International Company, Ltd., The: *See—*
Jones, William A.; Hing Yuen, Tse Lin Sin Tse; Rytomaa, Tapio; Harper, Norman J.; and Frost, Henry F., 4,294,824, Cl. 424-101.000.

Uniroyal, Inc.: *See—*
Plant, Howard L.; and Peterson, Glenn S., 4,294,970, Cl. 546-294.000.

United Kingdom Atomic Energy Authority: *See—*
Campbell, Charles S., 4,294,659, Cl. 165-133.000.
Hodgson, Thomas D.; and Jordan, Tony W. J., 4,294,805, Cl. 423-4.000.
Humphreys, Peter; Davidson, Daniel F.; and Thatcher, Gordon, 4,294,658, Cl. 376-404.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Wyeth, Harold W. G., 4,294,279, Cl. 137-264.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Aubusson, Russell C.; and Gledhill, Richard J., 4,295,182, Cl. 361-400.000.
United States Gypsum Company: *See—*
Kuhr, Albert F., 4,294,054, Cl. 52-484.000.
United States of America
Air Force: *See—*
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., 4,294,243, Cl. 128-201.180.
Husbands, Charles R., 4,294,508, Cl. 350-96.150.
Army: *See—*
Freeman, Charles F.; and Villhauer, Kurt, 4,295,073, Cl. 313-105.0CM.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Brockman, Milton H. Faraday rotation measurement method and apparatus. 4,295,140, Cl. 343-100.0PE.
Wang, William S. Low temperature latching solenoid. 4,295,111, Cl. 335-256.000.
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Baker, Joseph T.; Hoffler, George W.; and Hursta, William, 4,294,261, Cl. 128-691.000.
Fischell, David R.; and Mazique, Jeffrey C., 4,294,264, Cl. 128-778.000.
Navy: *See—*
Burnham, Ralph L., 4,295,104, Cl. 331-94.50C.
Johnson, Richard F., 4,295,200, Cl. 364-555.000.
Moore, Ronald D.; and Hall, John W., 4,294,112, Cl. 73-162.000.
Swenson, Richard C., 4,295,212, Cl. 367-20.000.
Tameo, Robert P., 4,294,135, Cl. 74-573.00R.
U.S. Philips Corporation: *See—*
Bex, Peter T. J.; and Asselman, George A. A., 4,294,139, Cl. 74-839.000.
Khoe, Giok D.; Kock, Hendrikus G.; Meuleman, Lambertus J.; and Van Ruyven, Lodewijk J., 4,295,152, Cl. 357-74.000.
Nissen, Nico; Op Het Veld, Sebastianus J.; and Schneider, Henri W., 4,295,158, Cl. 358-17.000.
United States Surgical Corporation: *See—*
Sloane, Thomas E., Jr.; Melius, Clair; and Kling, Erich, 4,294,594, Cl. 55-186.000.
United Technologies Corporation: *See—*
Blackburn, Martin J.; and Smith, Michael P., 4,294,615, Cl. 75-175.500.
Camp, Vann T., 4,294,069, Cl. 60-238.000.
Fowler, Donald W.; and Clelford, Douglas H., 4,294,162, Cl. 91-434.000.
Universal Optical Company, Inc.: *See—*
Arons, Irving J.; Merrill, Richard E.; and Drennan, Arthur P., 4,294,792, Cl. 264-311.000.
University of Auckland, The: *See—*
Boys, John T., 4,295,189, Cl. 363-41.000.
University of California, Regents of the: *See—*
Tanner, Robert M., 4,295,218, Cl. 371-40.000.
Urist, Marshall R., 4,294,753, Cl. 260-112.00R.
University of Delaware: *See—*
Fraenkel, Dan; and Gates, Bruce C., 4,294,725, Cl. 252-455.00Z.
University of Rochester: *See—*
Kende, Andrew S.; Curran, Dennis P.; King, Margaret L.; and Feldstein, Neil A., 4,294,763, Cl. 260-340.5DP.
University of Tennessee Research Corp.: *See—*
Hashemian, Hashem M.; Kerlin, Thomas W.; and Upadhyaya, Belle R., 4,295,128, Cl. 340-506.000.
University Patents, Inc.: *See—*
McMichael, John; Kline, Ellis L.; and Spaulding, James G., 4,294,818, Cl. 424-12.000.
Uniweld Products, Incorporated: *See—*
Pearl, Douglas B., 4,294,481, Cl. 294-146.000.
UOP Inc.: *See—*
Tadewald, Thomas D., 4,294,643, Cl. 156-293.000.
Uozumi, Junzo: *See—*
Sumiyoshi, Masaharu; Sekiya, Setsuro; Motosugi, Katsuhiko; Uozumi, Junzo; Ando, Tsuneo; Takeuchi, Yuzo; and Minoura, Mikio, 4,294,213, Cl. 123-454.000.
Upadek, Horst: *See—*
Conrad, Jens; Upadek, Horst; and Bruns, Klaus, 4,294,727, Cl. 252-522.00R.
Upadhyaya, Belle R.: *See—*
Hashemian, Hashem M.; Kerlin, Thomas W.; and Upadhyaya, Belle R., 4,295,128, Cl. 340-506.000.
Upjohn Company, The: *See—*
Prather, Richard A.; and Shah, Nirad N., 4,294,987, Cl. 564-331.000.
Sih, John C., 4,294,978, Cl. 562-503.000.
Sih, John C., 4,294,979, Cl. 562-503.000.
Sih, John C., 4,294,980, Cl. 562-503.000.
Sih, John C., 4,294,981, Cl. 562-503.000.
Sih, John C., 4,294,982, Cl. 562-503.000.
Sih, John C., 4,294,983, Cl. 562-503.000.
Sih, John C., 4,294,984, Cl. 562-503.000.
Smith, Herman W., 4,294,759, Cl. 260-326.270.
Upson, Donald A.; Campbell, Gerald A.; and Kestner, Diane E., to Eastman Kodak Company. Antistatic compositions comprising crosslinkable latex binders. 4,294,739, Cl. 260-29.6RW.
Upton, Eric L.: *See—*
Apple, Joseph; and Upton, Eric L., 4,294,543, Cl. 356-375.000.
Uram, John R., Jr., to Goodyear Aerospace Corporation. Transparencies produced from epoxy resins cured with adducts of trimethoxyboroxine and benzyl alcohol. 4,294,886, Cl. 428-412.000.
Urist, Marshall R., to University of California, The Regents of the. Bone morphogenetic protein process. 4,294,753, Cl. 260-112.00R.
Urlaub, Alfred; and Chmela, Franz, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Combustion method and device for practicing same. 4,294,206, Cl. 123-276.000.
Urquhart, Thomas, to Du Pont de Nemours, E. I., and Company. Apparatus for manufacturing flat plastic net. 4,294,646, Cl. 156-500.000.
Useldinger, Ronald E.: *See—*
Moore, Gerald L., 4,294,446, Cl. 272-133.000.
USM Corporation: *See—*
Marzouki, Taieb; and Schwisser, Bernd, 4,294,733, Cl. 260-28.50B.
Woodman, Daniel W., Jr., 4,293,999, Cl. 29-564.600.
Usuda, Matsuo: *See—*
Kawano, Tsuyoshi; Usuda, Matsuo; and Hirokawa, Toshio, 4,294,095, Cl. 72-51.000.
Vaccarella, Richard M.: *See—*
Hsieh, Peter K.; and Vaccarella, Richard M., 4,295,065, Cl. 307-475.000.
Vaisala Oy: *See—*
Ponkala, Jorma, 4,295,090, Cl. 324-60.0CD.
Ponkala, Jorma, 4,295,091, Cl. 324-60.0CD.
Vallentin, Werner: *See—*
Thiere, Helmuth; and Vallentin, Werner, 4,295,142, Cl. 343-781.0CA.
van Bilderbeek, Bernard H., to Vetco Inc. Subsea flowline connector. 4,294,471, Cl. 285-24.000.
Vance, Dwight A. Apparatus to indicate when a patient has evacuated a bed or demonstrates a restless condition. 4,295,133, Cl. 340-573.000.
Van Deusen, George S.; and Ogrinc, Joseph F., to Warner & Swasey Company, The. High speed gill box. 4,293,983, Cl. 19-127.000.
van de Water, Johan P.: *See—*
Visser, Pieter; and van de Water, Johan P., 4,294,720, Cl. 252-373.000.
Vanek, Edward A.: *See—*
Saccavino, Joseph F.; and Vanek, Edward A., 4,294,716, Cl. 252-68.000.
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T. Pyrometallurgical method and furnace for processing heavy nonferrous metal raw materials. 4,294,433, Cl. 266-161.000.
Vanlerberghe, Guy; Sebag, Henri; and Fiquet, Claire, to Societe Anonyme dite: L'Oreal. Shampoo and/or bubble bath composition containing surfactant and 1,2 alkane diol. 4,294,728, Cl. 252-542.000.
Van Luit, Richard D. Wall cabinet and method of making. 4,294,498, Cl. 312-245.000.
van Maanen, Johannes D., to Tevopharm-Schiedam B.V. Apparatus for positioning articles between the carriers of a drag conveyor, said articles being fed in a continuous closed row. 4,294,344, Cl. 198-461.000.
Van Pee, Willy: *See—*
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, 4,294,666, Cl. 203-72.000.
Van Ruyven, Lodewijk J.: *See—*
Khoe, Giok D.; Kock, Hendrikus G.; Meuleman, Lambertus J.; and Van Ruyven, Lodewijk J., 4,295,152, Cl. 357-74.000.
Van Steen, Jaak: *See—*
Astheimer, Hans J.; Brandtstaedter, Horst; Ohlinger, Rainer; Van Pee, Willy; Van Steen, Jaak; Sauer, Friedrich; Schmidt, Rudolf; and Krueger, Siegfried, 4,294,666, Cl. 203-72.000.
Van Uffelen, Jean-Pierre H., to Telecommunications Radioelectriques et Telephoniques. Arrangement for restituting the clock for a receiver of data transmitted by phase modulation of a carrier. 4,295,222, Cl. 375-106.000.
van Veen, Wouter M. D.: *See—*
Astegiano, Luciano; and van Veen, Wouter M. D., 4,295,007, Cl. 179-7.00R.
Vasiliev, Mikhail G.: *See—*
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas

B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Vasipari Kutato Intezet: *See*—
Tamas, Istvan; Tamas, Lajos; Kiss, Gyula; Kiss, Jozsef; and Kaldor, Antal, 4,294,611, Cl. 75-49.000.

VDO Adolf Schindling AG: *See*—
Sauerschell, Wolfgang; and Werkmann, Karl-Heinz, 4,294,108, Cl. 73-119.00A.

Veara, Jack R.: *See*—
O'Banion, Michael L.; and Veara, Jack R., 4,294,441, Cl. 269-97.000.

Veatch, William M., to Olympia Radiological Associates. Cystourethrographic examination chain. 4,294,260, Cl. 128-654.000.

Veb Kombinat Polygraph "Werner Lamberz" Leipzig: *See*—
Bottcher, Winfried; and Germer, Kurt, 4,294,182, Cl. 112-21.000.

Vellucci, Enzo, to E. R. Squibb & Sons, Inc. Transparent toothpaste having a medicinal action and process for its production. 4,294,894, Cl. 424-49.000.

Veltman, Preston L. Drying co-mingled carbohydrate solution and recycled product by dielectric heating. 4,294,624, Cl. 127-62.000.

Verbatim Corporation: *See*—
Martinelli, Lawrence G.; and Garrison, Mark R., 4,294,640, Cl. 156-213.000.

Verbrugge, Pieter A.: *See*—
Kramer, Petrus A.; and Verbrugge, Pieter A., 4,294,765, Cl. 260-343.30R.

Verbsky, James D.: *See*—
Stock, Albert M.; and Verbsky, James D., 4,294,997, Cl. 568-855.000.

Vereinigte aluminium-Werke Aktiengesellschaft: *See*—
Kruger, Jorg; Thome, Roland; Moritz, Dieter; Bings, Hubert; and Losert, Herbert, 4,294,816, Cl. 423-484.000.

Verheyen, Roland: *See*—
Funck, Willi; Verheyen, Roland; and Schedler, Heinz, 4,294,103, Cl. 72-453.140.

Verhoog, Hendrik M.: *See*—
Steen, Adam; and Verhoog, Hendrik M., 4,294,431, Cl. 266-44.000.

Vernat, Pierre: *See*—
Thuries, Edmond; Vernat, Pierre; and Sauvat, Roger, 4,295,023, Cl. 200-148.00R.

Verschuur, Eke, to Shell Oil Company. Dewatering of coal slurries. 4,294,584, Cl. 44-23.000.

Vescia, Michele: *See*—
Helfert, Herbert; Reinert, Friedrich; Richter, Paul; Vescia, Michele; and Wegerle, Dieter, 4,294,576, Cl. 8-137.500.

Vetco Inc.: *See*—
Ahlstone, Arthur G., 4,294,477, Cl. 285-336.000.
van Bilderbeek, Bernard H., 4,294,471, Cl. 285-24.000.

Viallet, Daniel: *See*—
Suppa, Vito; and Viallet, Daniel, 4,295,211, Cl. 367-4.000.

Vickers Limited: *See*—
Fairlie-Clarke, Anthony C., 4,295,134, Cl. 340-610.000.
Wielinga, Hans, 4,294,910, Cl. 430-302.000.

Vickers, Margaret R.: *See*—
Durant, Graham J.; Ganellin, Charon R.; and Vickers, Margaret R., 4,294,854, Cl. 424-326.000.

Victor Company of Japan, Ltd.: *See*—
Fujita, Mitsuo; and Matsumura, Koji, 4,295,080, Cl. 318-257.000.
Hirota, Akira; Kosaka, Yoshiteru; and Ashida, Kazutaka, 4,295,171, Cl. 360-73.000.
Machida, Toyotaka; and Ikemura, Yuichi, 4,295,157, Cl. 358-17.000.
Tanaka, Mitsuaki; and Suzuki, Hidetsugu, 4,295,006, Cl. 179-1.00E.
Watanabe, Yasuaki; and Noda, Teruaki, 4,295,165, Cl. 358-193.100.

Vierstraete, Jean. Sawing or cutting machine. 4,294,150, Cl. 83-453.000.

Viessmann, Hans. Heating boiler for liquid or gaseous fuels. 4,294,198, Cl. 122-136.00R.

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Ward, Roderick O., 4,293,980, Cl. 17-51.000.

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Gaidis, James M.; and Rosenberg, Arnold M., 4,294,813, Cl. 423-385.000.
Hill, Richard N., 4,294,809, Cl. 423-321.00R.

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Greppmair, Martin; and Grunwald, Wittloff, 4,294,136, Cl. 74-600.000.

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Chen, Evan N.; and Ferraro, Frank A., 4,294,010, Cl. 30-42.000.
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Watson, Arthur, to Lightburn & Co. Limited. Drive arrangement for concrete mixers. 4,294,548, Cl. 366-60.000.
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Webb, James E. Diesel fuel injector tool. 4,293,992, Cl. 29-267.000.
Weber, Paul J. Overhead bookholder. 4,294,425, Cl. 248-445.000.
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Wei, Chung H., to Stauffer Chemical Company. Reduction of scale formation during vinyl chloride polymerization with tin mercaptides. 4,294,945, Cl. 526-74.000.
Weiderrich, LeRoy J., to Pollination Technics, Inc. Leafcutter bee larvae extracting method and device. 4,293,966, Cl. 6-12.00R.
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Kovatch, George N.; and Wallace, James B., 4,295,053, Cl. 307-64.000.
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Peterson, Charles A.; and Grove, Louis C., Jr., 4,295,174, Cl. 361-16.000.
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Stacey, Eric J.; and Baker, Donal E., 4,295,190, Cl. 363-162.000.
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Weston, John B., to Burroughs Wellcome Co. Anti-protozoal oxadiazole derivatives. 4,294,843, Cl. 424-272.000.
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Strauss, Gary M., 4,294,542, Cl. 356-339.000.
Whaley, Morris L., to Morris Whaley, Inc. Boom sockets. 4,294,495, Cl. 308-174.000.
Whelan, James P.; to Ad-Tec Products, Inc. Paint strainer. 4,294,701, Cl. 210-497.200.
Whitehead, Richard O., to Shell Oil Company. Impact polymers. 4,294,937, Cl. 525-99.000.
Whitehouse, Hugh L., to Stanley Works, The. Torque measuring system for an air tool. 4,294,110, Cl. 73-862.230.
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Wiechert, Edelbert, to Siemens Aktiengesellschaft. Braking system for a transport car for transporting files. 4,294,337, Cl. 188-171.000.
Wielinga, Hans, to Vickers Limited. Printing plates. 4,294,910, Cl. 430-302.000.
Wiesinger, Horst; and Scheurecker, Werner, to Voest-Alpine Aktiengesellschaft. Supporting and guiding stand arrangement to be used in a bow-type continuous casting plant. 4,294,307, Cl. 164-448.000.
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Wiggins, Douglas G., to Xerox Corporation. Carriage speed control for a raster scanner. 4,295,167, Cl. 358-285.000.
Wiggins, Garfield. Doweling jig template. 4,294,567, Cl. 408-72.00R.
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Wildnauer, Richard H.; and Humphries, William T., to Johnson & Johnson. Skin treating compositions. 4,294,852, Cl. 424-317.000.
Wilfer, Oskar, to H. F. & Ph. F. Reemtsma. Folding box. 4,294,399, Cl. 229-44.0CB.
Wilke, Gerhard. Process for the production of pastry and flaky pastry-like products. 4,294,862, Cl. 426-502.000.
Wilkerson, Edward D. Automobile height gauge. 4,294,016, Cl. 33-180.0AT.
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Williams, John W.; Smith, Robert A.; and Arbir, Francis W., to Abbott Laboratories. Biocidal additive for cutting fluids. 4,294,853, Cl. 424-319.000.
Wilmarth, Paul C., to RCA Corporation. Color television receiver degaussing circuit. 4,295,078, Cl. 315-8.000.
Wilms, Klaus G.; and Waldmann, Helmut, to Bayer Aktiengesellschaft. Hydrogen peroxide treatment of effluent. 4,294,703, Cl. 210-631.000.
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Wilson, Jack A. Rotary electrical junction assembly. 4,294,500, Cl. 339-5.00M.
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Wilson, Worley C., to Telemetry Controls, Inc. Programmable control system. 4,295,191, Cl. 364-104.000.

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Winzer, Frederick W.; and Ault, James R., to Emhart Industries, Inc. Glass forehearth construction. 4,294,603, Cl. 65-346.000.

Wion, David W., to Magmate Australia Proprietary Limited. Figure for arrangement on magnetically attractive surface. 4,294,036, Cl. 46-242.000.

Witherspoon, Romeo R., to General Motors Corporation. PTFE-Bound talc separators for secondary zinc alkaline batteries. 4,294,899, Cl. 429-206.000.

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Wittwer, Norman C., to Bell Telephone Laboratories, Incorporated. Semiconductor integrated circuit protection arrangement. 4,295,176, Cl. 361-91.000.

Wnek, Kenneth A. Convertible ski carrying apparatus. 4,294,387, Cl. 224-315.000.

Woelfel, James A., to Motor Wheel Corporation. Fiber-reinforced composite wheel construction. 4,294,490, Cl. 301-63.0PW.

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Wolfson, Sidney K., Jr.: *See*—
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Woodhouse, Richard G.; and Salway, Peter H., to Lucas Industries Limited. Control circuits for solenoids. 4,295,177, Cl. 361-154.000.

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Snelling, Christopher, 4,294,534, Cl. 355-3.00R.
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Asinovsky, Erik I.; Afanasiev, Anatoly A.; Pakhomov, Evgeny P.; Zeigarnik, Vladimir A.; and Yartsev, Ivan M., 4,295,021, Cl. 200-147.00R.

Yasuda, Eturo: *See*—
Segawa, Yoshihiro; Ohta, Minoru; and Yasuda, Eturo, 4,294,801, Cl. 422-98.000.

Yasuhara, Seishi; and Ohnishi, Eiichi, to Nissan Motor Co., Ltd. Intake port means for extracting engine exhaust gas for recirculation. 4,294,220, Cl. 123-568.000.

Yasui, Seimei: *See*—
Hino, Minoru; Oshima, Takao; Hayatsu, Kazuo; Yamamoto, Michio; and Yasui, Seimei, 4,294,940, Cl. 525-124.000.

Yasukawa, Eiki: *See*—
Kihara, Kunio; Toda, Hideo; Yasukawa, Eiki; Ishibashi, Toshiaki; and Tokita, Taketoshi, 4,294,933, Cl. 521-27.000.

Yokota, Akiyoshi: *See*—
Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, 4,294,976, Cl. 560-76.000.

Yokota, Yukio: *See*—
Yagihara, Morio; and Yokota, Yukio, 4,294,918, Cl. 430-553.000.

Yoneda, Naoto; Kato, Jyoji; and Kinashi, Keizo, to Tanabe Seiyaku Co., Ltd. Tetrahydroisoquinoline compounds and a pharmaceutical composition thereof. 4,294,832, Cl. 424-258.000.

Yoneda, Takoao: *See*—
Enomoto, Minoru; Yoneda, Takoao; and Takeuchi, Yoshiyuki, 4,294,045, Cl. 51-165.710.

Yonker, John H.; Fisher, Ernest P., Jr.; and Bills, David, to Otis Engineering Corporation. Landing nipple. 4,294,315, Cl. 166-322.000.

Yoshibayashi, Shigeru: *See*—
Shima, Ichiji; Yamamoto, Tatsuo; Yoshibayashi, Shigeru; Teshima, Hiroshi; Hizume, Akio; Iki, Tetsuo; Yamamoto, Takashi; Kanamori, Kyozo; and Tanaka, Shigeho, 4,294,120, Cl. 73-650.000.

Yoshida, Hajime, to Hajime Industries Ltd. Pattern data processing method and apparatus to practice such method. 4,295,120, Cl. 340-146.3MA.

Yoshida, Hiroshi: *See*—
Aoki, Shinji; Kawamura, Keita; Kimura, Hitoshi; Katayama, Tsutomu; Kaido, Chikara; and Yoshida, Hiroshi, 4,294,674, Cl. 204-157.10H.

Yoshii, Kazuhiro, to Sanyo Electric Co. Ltd.; and Tokyo Sanyo Electric. Absorption refrigerating system. 4,294,076, Cl. 62-235.100.

Yoshikiyo, Motozoh: *See*—
Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, 4,294,976, Cl. 560-76.000.

Yoshimoto, Hataaki: *See*—
Itatani, Hiroshi; Yoshimoto, Hataaki; Shiotani, Akinori; Yokota, Akiyoshi; and Yoshikiyo, Motozoh, 4,294,976, Cl. 560-76.000.

Yoshino, Kimiaki: *See*—
Takashima, Yuji; Ishida, Eisuke; Nishiguchi, Hisanori; and Yoshino, Kimiaki, 4,294,902, Cl. 430-45.000.

Yoshioka, Masahiro; Koike, Toshifumi; and Izumi, Hideki, to Hitachi, Ltd. Sliding-type bearing. 4,294,494, Cl. 308-76.000.

Yoshioka, Susumu: *See*—
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,294,803, Cl. 422-111.000.

Yoshioka, Tamotu: *See*—
Mizuguchi, Ryuzo; Ishikura, Sinichi; Ishii, Keizou; and Yoshioka, Tamotu, 4,294,740, Cl. 260-29.6RB.

Yoshitugu, Ken: *See*—
Toyota, Akinori; Yoshitugu, Ken; and Kashiwa, Norio, 4,294,948, Cl. 526-125.000.

Young, Ching T., to Bendix Autolite Corporation. Method of measuring oxygen and process for pretreating a solid electrolyte oxygen gas sensing element. 4,294,668, Cl. 204-1.00T.

Young, Dick K.; and Sumner, Kenneth E., to Marathon Oil Company. Quick opening internal manway for towers. 4,294,049, Cl. 52-20.000.

Young, Leroy: *See*—
Schlotter, Harold J.; and Young, Leroy, 4,294,452, Cl. 273-403.000.

Youngson, Charles R., Jr.: *See*—
Tamony, Andree E.; and Youngson, Charles R., Jr., 4,294,928, Cl. 423-235.000.

Zachary, Richard E., to Dow Chemical Company, The. Method for removing trapped gas under pond liners. 4,294,589, Cl. 55-36.000.

Zaitsev, Vladimir Y.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Zalewski, Z. Leo: *See*—
Lloyd, C. F.; Zalewski, Z. Leo; and Brendle, Paul C., 4,295,066, Cl. 310-30.000.

Zauner, Christian W. Head gear. 4,293,958, Cl. 2-12.000.

Zeigarnik, Vladimir A.: *See*—
Asinovsky, Erik I.; Afanasiev, Anatoly A.; Pakhomov, Evgeny P.; Zeigarnik, Vladimir A.; and Yartsev, Ivan M., 4,295,021, Cl. 200-147.00R.

Zergenyi, Janos, to Ciba-Geigy Corporation. Process for inverting the configuration in optically active compounds. 4,294,966, Cl. 544-316.000.

Ziberov, Valentin E.: *See*—
Vanjukov, Andrei V.; Mechev, Valery V.; Bystrov, Valentin P.; Ezhov, Evgeny I.; Vasiliev, Mikhail G.; Zaitsev, Vladimir Y.; Romenets, Vladimir A.; Ivanov, Vladimir V.; Golik, Sergei Y.; Grin-Gnatovsky, Evgeny S.; Grechko, Alexandr V.; Savin, Ivan V.; Kozhakhmetov, Sultanbek M.; Meierovich, Veniamin B.; Nagibin, Vladimir D.; Ramazanov, Nariman A.; Umarov, Almas B.; Ziberov, Valentin E.; Kunaev, Askar M.; Takezhanov, Sauk T.; Alexandrov, Petr A.; Kolesnikov, Boris I.; and Khagazheev, Dzhonson T., 4,294,433, Cl. 266-161.000.

Zielinski, Jan: *See*—
Falkowski, Leonard; Stefanska, Barbara; Zielinski, Jan; Troka, Elzbieta; Golik, Jerzy; Kolodziejczyk, Pawel; Jarzebski, Andrzej; Cybulska, Emilia; and Borowski, Edward, 4,294,958, Cl. 536-17.00R.

Zimmer USA, Inc.: *See*—
Fuson, Robert L., 4,293,962, Cl. 3-1.900.
Gold, Barry L.; and Bolesky, Richard C., 4,293,963, Cl. 3-1.910.

Zushi, Sadao; and Oida, Yoshio, to Tokyo Shibaura Electric Co., Ltd. Microwave ovens with programmable control. 4,295,027, Cl. 219-10.55B.

Zyntrax Corporation, The: *See*—
Woloshuk, Edward A.; Walz, Gregory J.; and Kretzschmar, Robert O., 4,294,523, Cl. 352-86.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF OCTOBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aladdin Industries, Incorporated: *See—*
Bramming, Carl, deceased; Bramming, Clara B., heir; Bramming, Kenneth R., heir; and Wheeler, Beverley B., heir, Re. 30,768, Cl. 215-13.00R.

Bentz, Erwin J. H., to Caterpillar Tractor Co. Modular heat exchanger with pivotal cores. Re. 30,766, Cl. 165-41.000.

Bramming, Carl, deceased; by Bramming, Clara B., heir; by Bramming, Kenneth R., heir; and by Wheeler, Beverley B., heir, to Aladdin Industries, Incorporated. Vacuum insulated bottle. Re. 30,768, Cl. 215-13.00R.

Bramming, Clara B., heir: *See—*
Bramming, Carl, deceased; Bramming, Clara B., heir; Bramming, Kenneth R., heir; and Wheeler, Beverley B., heir, Re. 30,768, Cl. 215-13.00R.

Bramming, Kenneth R., heir: *See—*
Bramming, Carl, deceased; Bramming, Clara B., heir; Bramming, Kenneth R., heir; and Wheeler, Beverley B., heir, Re. 30,768, Cl. 215-13.00R.

Bussjager, Rudy C., to Carrier Corporation. Heat pump system. Re. 30,765, Cl. 62-115.000.

Carrier Corporation: *See—*
Bussjager, Rudy C., Re. 30,765, Cl. 62-115.000.

Caterpillar Tractor Co.: *See—*
Bentz, Erwin J. H., Re. 30,766, Cl. 165-41.000.
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., to Caterpillar Tractor Co. Mounting arrangement for impact rock-breaker. Re. 30,769, Cl. 299-67.000.

Dauben, Dwight L.: *See—*
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., Re. 30,767, Cl. 166-261.000.

Dowbenko, Rostyslaw: *See—*
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, Re. 30,772, Cl. 525-421.000.

Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., to Standard Oil Company (Indiana). Method using lignosulfonates for high-temperature plugging. Re. 30,767, Cl. 166-261.000.

Fidler, Jerry D.: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Fish, Elson B.: *See—*
Shobert, Samuel M.; and Fish, Elson B., Re. 30,770, Cl. 156-180.000.

Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Amide-modified urethane acrylate radiation curable compounds and coating compositions and methods of making same. Re. 30,772, Cl. 525-421.000.

Glaser, Paul F.; and Orford, Richard J., to Transaction Technology, Inc. Transaction terminal. Re. 30,773, Cl. 235-379.000.

Gruber, Gerald W.: *See—*
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, Re. 30,772, Cl. 525-421.000.

Gutman, Nathan: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Livesay, Richard E.: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Marrs, Richard E.: *See—*
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., Re. 30,767, Cl. 166-261.000.

Orford, Richard J.: *See—*
Glaser, Paul F.; and Orford, Richard J., Re. 30,773, Cl. 235-379.000.

Plas/Steel Products, Inc.: *See—*
Shobert, Samuel M.; and Fish, Elson B., Re. 30,770, Cl. 156-180.000.

PPG Industries, Inc.: *See—*
Friedlander, Charles B.; Gruber, Gerald W.; and Dowbenko, Rostyslaw, Re. 30,772, Cl. 525-421.000.

Shobert, Samuel M.; and Fish, Elson B., to Plas/Steel Products, Inc. Method for fabricating improved fiber reinforced plastic rods having a smooth surface. Re. 30,770, Cl. 156-180.000.

Simmons, Gerald P.: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Standard Oil Company (Indiana): *See—*
Felber, Betty J.; Dauben, Dwight L.; and Marrs, Richard E., Re. 30,767, Cl. 166-261.000.

Stemler, Orrin A.: *See—*
Cobb, Delwin E.; Fidler, Jerry D.; Gutman, Nathan; Livesay, Richard E.; Simmons, Gerald P.; and Stemler, Orrin A., Re. 30,769, Cl. 299-67.000.

Transaction Technology, Inc.: *See—*
Glaser, Paul F.; and Orford, Richard J., Re. 30,773, Cl. 235-379.000.

Wheeler, Beverley B., heir: *See—*
Bramming, Carl, deceased; Bramming, Clara B., heir; Bramming, Kenneth R., heir; and Wheeler, Beverley B., heir, Re. 30,768, Cl. 215-13.00R.

Zondek, Klaus. Method of protecting the hulls of marine vessels from fouling. Re. 30,771, Cl. 156-196.000.

LIST OF DESIGN PATENTEES

Abraham, Anthony S., to Lever Brothers Company. Combined box and lid. 261,234, 10-13-81, Cl. D9-432.000.

Akita, Tsugio: *See—*
Yoshida, Toshihiko; Tatsumi, Masakazu; Sakakibara, Seiichi; Kubo, Toshiki; Akita, Tsugio; and Ueda, Yoshiaki, 261,266, Cl. D32-21.000.

Allen, Alton K.: *See—*
Mintz, Richard P.; Buttner, Ronald A.; and Allen, Alton K., 261,243, Cl. D10-121.000.

Altadonna, James. Container for carrying first aid data and equipment. 261,198, 10-13-81, Cl. D2-400.000.

American Cyanamid Company: *See—*
Grip, John A., 261,231, Cl. D9-370.000.
Grip, John A., 261,232, Cl. D9-370.000.

Arai, Noriyuki: *See—*
Kurokawa, Koya; Arai, Noriyuki; Takahashi, Hideo; and Saeki, Taisuke, 261,263, Cl. D14-2.000.

Austin, David D.: *See—*
Becker, James R.; Austin, David D.; and Rudat, Ronald A., 261,283, Cl. D21-33.000.

Barrett, Walter H., to Columbia Chase Corporation. Solar demonstration unit. 261,279, 10-13-81, Cl. D19-62.000.

Barringer, Jack E.: *See—*
Clink, Sterling A.; and Barringer, Jack E., 261,294, Cl. D21-195.000.

Bautch, Roger F.: *See—*
Lange, Arthur E.; and Bautch, Roger F., 261,251, Cl. D11-157.000.

Baxter Travenol Laboratories, Inc.: *See—*
Williams, Robert P., 261,236, Cl. D9-435.000.

Becker, James R.; Austin, David D.; and Rudat, Ronald A., to Hasbro Industries, Inc. Game board. 261,283, 10-13-81, Cl. D21-33.000.

Bird, John J. Bottle. 261,230, 10-13-81, Cl. D9-367.000.

Birmingham, Joan T. Ornament preform. 261,248, 10-13-81, Cl. D11-121.000.

Birmingham, Joan T. Creature ornament. 261,249, 10-13-81, Cl. D11-128.000.

Birmingham, Joan T. Creature ornament. 261,250, 10-13-81, Cl. D11-128.000.

Black & Decker Inc.: *See—*
Bunyea, Roderick F., 261,222, Cl. D8-68.000.

Blake, Jack E. Stand. 261,201, 10-13-81, Cl. D6-85.000.

Braun Aktiengesellschaft: *See—*
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,317, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,318, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,319, Cl. D28-35.000.

Breneman, Jack L., to Quaker Oats Company, The. Toy space shuttle. 261,286, 10-13-81, Cl. D21-87.000.

Bridgestone Tire Co., Ltd.: *See—*
Yamazaki, Naoki; Kojima, Hiroshi; and Nishio, Hideaki, 261,256, Cl. D12-148.000.

Bunyea, Roderick F., to Black & Decker Inc. Pneumatic impact wrench. 261,222, 10-13-81, Cl. D8-68.000.

Buttner, Ronald A.: *See—*
Mintz, Richard P.; Buttner, Ronald A.; and Allen, Alton K., 261,243, Cl. D10-121.000.

Caldwell, Joseph M. Pulley for compound archery bows. 261,296, 10-13-81, Cl. D22-5.000.

Camsco, Inc.: *See—*
Gobeli, Gregg P., 261,274, Cl. D18-7.000.

Canon Kabushiki Kaisha: *See—*
Sakai, Masaaki; and Uematsu, Sakae, 261,273, Cl. D18-7.000.

Capanear, Patricia. Tablecloth. 261,210, 10-13-81, Cl. D6-286.000.

Capitol Products Corporation: *See—*
Schmidt, Dietrich F., 261,304, Cl. D25-74.000.
Schmidt, Dietrich F., 261,305, Cl. D25-74.000.
Schmidt, Dietrich F., 261,306, Cl. D25-74.000.
Schmidt, Dietrich F., 261,307, Cl. D25-74.000.
Schmidt, Dietrich F., 261,308, Cl. D25-74.000.
Schmidt, Dietrich F., 261,309, Cl. D25-74.000.
Schmidt, Dietrich F., 261,310, Cl. D25-74.000.
Schmidt, Dietrich F., 261,311, Cl. D25-74.000.
Schmidt, Dietrich F., 261,312, Cl. D25-74.000.
Schmidt, Dietrich F., 261,313, Cl. D25-74.000.
Schmidt, Dietrich F., 261,314, Cl. D25-74.000.
Schmidt, Dietrich F., 261,315, Cl. D25-74.000.
Schmidt, Dietrich F., 261,316, Cl. D25-74.000.

Carbajales Santa-Eulalia, Javier B.: *See—*
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 261,252, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 261,253, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 261,254, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a bulldog. 261,252, 10-13-81, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a lynx. 261,253, 10-13-81, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a poodle. 261,254, 10-13-81, Cl. D11-158.000.

Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, to Microsonics Corporation. Casing for a microphonograph. 261,264, 10-13-81, Cl. D14-14.000.

Christensen, Kurt. Disk for a menstrual calendar. 261,275, 10-13-81, Cl. D18-10.000.

Clark, Robin, to Hilary Page "Sensible" Toys Limited. Gingerbread man rattle. 261,285, 10-13-81, Cl. D21-65.000.

Clean City Squares, Inc.: *See—*
Gilbert, William A., 261,218, Cl. D34-1.000.

Clink, Sterling A.; and Barringer, Jack E. Arm wrestling device. 261,294, 10-13-81, Cl. D21-195.000.

Coca-Cola Company, The: *See—*
Cornett, Donald F., 261,269, Cl. D15-116.000.

Columbia Chase Corporation: *See—*
Barrett, Walter H., 261,279, Cl. D19-62.000.

Cornett, Donald F., to Coca-Cola Company, The. Combined dispenser cabinet and stand. 261,269, 10-13-81, Cl. D15-116.000.

Dart Industries Inc.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,215, Cl. D7-131.000.

Datasonic, Inc.: *See—*
Mintz, Richard P.; Buttner, Ronald A.; and Allen, Alton K., 261,243, Cl. D10-121.000.

Davis, Lester M. Fishing lure. 261,298, 10-13-81, Cl. D22-27.000.

Denker, William B.; and Frank, Jeanne C., to Red Owl Stores, Inc. Cash register attachment for screening keys. 261,276, 10-13-81, Cl. D18-12.000.

Dockery, Allen W. Cane. 261,199, 10-13-81, Cl. D3-7.000.

Dowco Corporation: *See—*
Sanderson, Paul H., Jr., 261,224, Cl. D8-323.000.

Durand, Jean-Jacques. Goblet or similar article. 261,211, 10-13-81, Cl. D7-13.000.

Dvorsky, Daniel A. Quick release honda. 261,229, 10-13-81, Cl. D8-396.000.

Easterday, James E. Fishing lure. 261,299, 10-13-81, Cl. D22-27.000.

Emerson Electric Co.: *See—*
Seeley, Wayne R., 261,260, Cl. D13-18.000.

Epstein, Elias, to Kaspar & Esh, Inc. Earring. 261,245, 10-13-81, Cl. D11-75.000.

Epstein, Elias, to Kaspar & Esh, Inc. Earring. 261,246, 10-13-81, Cl. D11-75.000.

Epstein, Elias, to Kaspar & Esh, Inc. Earring. 261,247, 10-13-81, Cl. D11-75.000.

Ervin, William R. Model ship. 261,255, 10-13-81, Cl. D11-163.000.

FIC Corporation: *See—*
Linton, John C., 261,261, Cl. D13-35.000.
Linton, John C., 261,262, Cl. D13-35.000.

First Champaign Corporation: *See—*
Perethian, Charles M.; Le Compte, Marcia L.; and Vetter, Bruce W., 261,213, Cl. D7-77.000.

Frank, Jeanne C.: *See—*
Denker, William B.; and Frank, Jeanne C., 261,276, Cl. D18-12.000.

Free, John H.: *See—*
Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., 261,215, Cl. D7-131.000.

Friedrich Grohe Armaturenfabrik GmbH & Co.: *See—*
Klose, Odo, 261,300, Cl. D23-35.000.

General Mills, Inc.: *See—*
Richmond, Colin B., II, 261,216, Cl. D7-137.000.

Gilbert, William A., to Clean City Squares, Inc. Refuse container. 261,218, 10-13-81, Cl. D34-1.000.

Glen Shoe Company: *See—*
Weiss, Howard K., 261,195, Cl. D2-279.000.

Gobeli, Gregg P., to Camsco, Inc. Digitizer cursor for computer drafting. 261,274, 10-13-81, Cl. D18-7.000.

Goertz, Albrecht, to Rolodex Corporation. Rotary card file. 261,280, 10-13-81, Cl. D19-76.000.

Gradco/Dendoki, Inc.: *See—*
Lawrence, Frederick J., 261,272, Cl. D16-32.000.

Green, Marianne C., to Koehring Company. Container for liquids or the like. 261,233, 10-13-81, Cl. D9-398.000.

Greubel, Jurgen: *See—*
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,317, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,318, Cl. D28-35.000.
Oberheim, Robert; Greubel, Jurgen; and Rams, Dieter, 261,319, Cl. D28-35.000.

Griffin, Robert P. Sportsman's belt. 261,196, 10-13-81, Cl. D2-383.000.

Grip, John A., to American Cyanamid Company. Bottle or similar article. 261,231, 10-13-81, Cl. D9-370.000.

Grip, John A., to American Cyanamid Company. Bottle and cap or similar article. 261,232, 10-13-81, Cl. D9-370.000.

Groh, Leo A.; Ludwig, Douglas D.; Painter, David L.; and Free, John H., to Dart Industries Inc. Coffee urn lid. 261,215, 10-13-81, Cl. D7-131.000.

Guidry, Warren L., to Interco Marketing, Incorporated. Tire. 261,257, 10-13-81, Cl. D12-146.000.

Haller, John L. Hydrotherapy pool with slide. 261,303, 10-13-81, Cl. D24-38.000.

Hasbro Industries, Inc.: *See—*
Becker, James R.; Austin, David D.; and Rudat, Ronald A., 261,283, Cl. D21-33.000.
Samuels, Donald H.; and Newton, Brian L., 261,293, Cl. D21-151.000.

Hashimoto, Masanori; and Soda, Koichi, to Ricoh Company Ltd. Printer ribbon cassette. 261,277, 10-13-81, Cl. D18-12.000.

Haufe, David K., to Sunbeam Corporation. Digital clock or the like. 261,237, 10-13-81, Cl. D10-15.000.

HEWI, Heinrich Wilke GmbH: *See—*
Scholl, Winfried, 261,223, Cl. D8-312.000.

Hicks, Enoch E. Game board. 261,282, 10-13-81, Cl. D21-24.000.

Hilary Page "Sensible" Toys Limited: *See—*
Clark, Robin, 261,285, Cl. D21-65.000.

Hilko, Steven E., to Quaker Oats Company, The. Toy space rocket. 261,287, 10-13-81, Cl. D21-87.000.

Hilko, Steven E., to Quaker Oats Company, The. Toy glider. 261,288, 10-13-81, Cl. D21-89.000.

Hug, Niklaus, to Rommag P. Worwag & Co. Vacuum cleaner. 261,267, 10-13-81, Cl. D32-21.000.

Interco Marketing, Incorporated: *See—*
Guidry, Warren L., 261,257, Cl. D12-146.000.

Ishimaru, Lloyd Y.: *See—*
Carey, Bruce P.; Ishimaru, Lloyd Y.; and Shimano, Moto, 261,264, Cl. D14-14.000.

Jeffrey, Alfred D. Combined swimming pool cover-roller and brake. 261,270, 10-13-81, Cl. D15-199.000.

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Lange, Arthur E.; and Bautch, Roger F. Desk ornament. 261,251, 10-13-81, Cl. D11-157.000.

Latimer, Margaret D. Iron holder. 261,219, 10-13-81, Cl. D32-73.000.

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Sanderson, Paul H., Jr., to Dowco Corporation. Pivot pin for movable louvers or the like. 261,224, 10-13-81, Cl. D8-323.000.

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34 4,294,609
43 4,294,610
49 4,294,611
68 R 4,294,612
124 4,294,613
128 A 4,294,614
175.5 4,294,615
234 4,294,616

CLASS 81

3 R 4,294,141
57.37 4,294,142

CLASS 83

37 4,294,143
71 4,294,144
302 4,294,145
316 4,294,146
382 4,294,147
397 4,294,148
435.1 4,294,149
453 4,294,150
477.2 4,294,151
588 4,294,152

CLASS 84

1.01 4,294,153
4,294,154
4,294,155

CLASS 89

1 G 4,294,157
12 4,294,158

CLASS 91

375 A 4,294,159
378 4,294,160
422 4,294,161
434 4,294,162

CLASS 92

52 4,294,163
243 4,294,164

CLASS 98

1 4,294,165

CLASS 99

348 4,294,166
369 4,294,167
494 4,294,168

CLASS 100

48 4,294,169
216 4,294,170

CLASS 101

281 4,294,173
317 4,294,171
473 4,294,172

CLASS 104

250 4,294,174

CLASS 105

199 R 4,294,175
363 4,294,176

CLASS 106

14.37 4,294,617
188 4,294,619
288 Q 4,294,620
306 4,294,621
314 4,294,622

CLASS 108

42 4,294,177

CLASS 110

347 4,294,178

CLASS 111

3 4,294,179
52 4,294,180
87 4,294,181

CLASS 112

21 4,294,182

CLASS 114

42 4,294,183
61 4,294,184
75 4,294,185
151 4,294,186

CLASS 118

244 4,294,187
305 4,294,188
603 4,294,189
620 4,294,190
634 4,294,191
650 4,294,192
718 4,294,193
719 4,294,194

CLASS 119

20 4,294,195
27 4,294,196
60 4,294,197

CLASS 122

136 R 4,294,198
276 4,294,199
406 S 4,294,200

CLASS 123

73 PP 4,294,202
73 R 4,294,201
195 R 4,294,203
198 DB 4,294,204
274 4,294,205
276 4,294,206
279 4,294,207
285 4,294,208
293 4,294,209
300 4,294,210
379 4,294,211
440 4,294,212
454 4,294,213
458 4,294,214
470 4,294,215
489 4,294,216
491 4,294,217
502 4,294,218
557 4,294,219
568 4,294,220

CLASS 124

23 R 4,294,221
25 4,294,222

CLASS 126

112 4,294,223
135 4,294,224
204 4,294,225
286 4,294,226
400 4,294,227
430 4,294,228
434 4,294,229
438 4,294,230
441 4,294,231
443 4,294,232

CLASS 127

55 4,294,623
62 4,294,624

CLASS 128

4 4,294,233
6 4,294,234
11 4,294,235
25 B 4,294,236
77 4,294,237
80 G 4,294,238
96 4,294,239
156 4,294,240
4,294,241
201.13 4,294,242
201.18 4,294,243
202.26 4,294,244
207.21 4,294,245
214 D 4,294,247
214 E 4,294,246
4,294,248
214 G 4,294,249
247 4,294,250
276 4,294,251
283 4,294,252
285 4,294,253
303.14 4,294,254
334 C 4,294,255
419 PT 4,294,256
495 4,294,257
635 4,294,258
653 4,294,259
654 4,294,260
691 4,294,261
726 4,294,262
736 4,294,263
778 4,294,264

CLASS 131

277 4,294,266
330 4,294,267
366 4,294,265

CLASS 132

73 4,294,268
84 B 4,294,269
112 4,294,270

CLASS 134

113 4,294,271
138 4,294,272

CLASS 136

244 4,295,002

CLASS 137

1 4,294,273
7 4,294,274
15 4,294,275
67 4,294,276
101.19 4,294,277
115 4,294,278
264 4,294,279
268 4,294,280
541 4,294,281
595 4,294,282
601 4,294,283
613 4,294,284
625.11 4,294,285
625.48 4,294,286
625.69 4,294,287

CLASS 138

30 4,294,288
44 4,294,289

CLASS 139

26 4,294,290
438 4,294,291

CLASS 141

1 4,294,292
100 4,294,293
179 4,294,294

CLASS 144

3 K 4,294,295
120 4,294,296
134 D 4,294,297
193 C 4,294,298

CLASS 148

2 4,294,625
6.14 R 4,294,627
6.2 4,294,626
6.35 4,294,628
11.5 C 4,294,629
16.6 4,294,630
133 4,294,631
142 4,294,632

CLASS 149

2 4,294,633

CLASS 150

28 R 4,294,299

CLASS 152

427 4,294,301

CLASS 156

59 4,294,634
89 4,294,635
143 4,294,636
157 4,294,637
176 4,294,638
180 Re.30,770
185 4,294,639
196 Re.30,771
213 4,294,640
234 4,294,641
250 4,294,642
293 4,294,643
361 4,294,644
384 4,294,645
500 4,294,646
558 4,294,647
627 4,294,648
645 4,294,649
660 4,294,650
662 4,294,651

CLASS 159

2 R 4,294,652

CLASS 160

133 4,294,302

CLASS 162

25 4,294,653
50 4,294,654
107 4,294,655
192 4,294,656
303 4,294,657

CLASS 164

44 4,294,303
150 4,294,305
448 4,294,306
4,294,307
504 4,294,304

CLASS 165

1 4,294,308
18 4,294,309
41 Re.30,766
104 S 4,294,311
104.13 4,294,310
133 4,294,659
134 R 4,294,312

CLASS 166

117.5 4,294,313
261 Re.30,767
318 4,294,314
322 4,294,315

CLASS 172

20 4,294,316

CLASS 173

57 4,294,317

CLASS 174

53 4,295,003
87 4,295,004
92 4,295,005

CLASS 175

321 4,294,318
389 4,294,319

CLASS 177

1 4,294,320
210 FP 4,294,321
210 R 4,294,322

CLASS 179

1 E 4,295,006
7 R 4,295,007
18 BC 4,295,008
110 A 4,295,009
4,295,010
115.5 VC 4,295,011

CLASS 180

54 B 4,294,323
89.14 4,294,324
148 4,294,325
255 4,294,326
273 4,294,327

CLASS 181

120 4,294,328
222 4,294,329
230 4,294,330

CLASS 182

10 4,294,331
141 4,294,332

CLASS 184

106 4,294,333

CLASS 188

18 A 4,294,334
71.9 4,294,335
72.4 4,294,336
171 4,294,337

CLASS 192

0.073 4,294,341
4 A 4,294,338
12 BA 4,294,339
56 R 4,294,340
105 CD 4,294,342
113 A 4,294,343

CLASS 198

461 4,294,344
683 4,294,345
740 4,294,346
751 4,294,347

CLASS 200

5 B 4,295,012
11 C 4,295,013
19 R 4,295,014
38 R 4,295,015
44 4,295,016
47 4,295,017
51.09 4,295,018
61.2 4,295,019
61.45 R 4,295,020
147 R 4,295,021
4,295,022
148 R 4,295,023
288 4,295,024
4,295,025
331 4,295,026

CLASS 201

39 4,294,663

CLASS 203

19 4,294,664
50 4,294,665
72 4,294,666

CLASS 204

1 T 4,294,667
4,294,668
15 4,294,669
26 4,294,670
128 4,294,671
129.4 4,294,672
129.46 4,294,673
157.1 H 4,294,674
159.14 4,294,675
159.23 4,294,676
181 F 4,294,677
192 R 4,294,678
195 S 4,294,679
224 R 4,294,680
4,294,681
244 4,294,682
258 4,294,683
299 R 4,294,684

CLASS 206

1.7 4,294,348
63.5 4,294,349
216 4,294,350
222 4,294,351
223 4,294,352
273 4,294,353
335 4,294,354
339 4,294,355
368 4,294,356
409 4,294,357
419 4,294,358
422 4,294,359
438 4,294,360
532 4,294,361
622 4,294,362

CLASS 208

10 4,294,685
56 4,294,686
58 4,294,687
164 4,294,688
326 4,294,689

CLASS 209

3 4,294,690
3.1 4,294,691
300 4,294,692
466 4,294,693

CLASS 210

150 4,294,694
173 4,294,695
220 4,294,696
221.1 4,294,697
242.3 4,294,698
287 4,294,699
403 4,294,700
497.2 4,294,701
513 4,294,702
631 4,294,703
651 4,294,704
695 4,294,705
762 4,294,706
782 4,294,707

CLASS 211

49 D 4,294,363
60 R 4,294,364
4,294,365

CLASS 215

1 C 4,294,366
13 R Re.30,768
246 4,294,367
256 4,294,368
311 4,294,369
329 4,294,370

CLASS 219

10.55 B 4,295,027
4,295,028
61 4,294,662
75 4,295,029
121 PH 4,295,030
125.12 4,295,031
137 R 4,295,032
388 4,295,033
400 4,295,034
536 4,295,035

CLASS 220

4 E 4,294,371
20 4,294,372
70 4,294,373
71 4,294,374
293 4,294,375
318 4,294,376
321 4,294,377
323 4,294,378
404 4,294,379

CLASS 221

195 4,294,380

CLASS 222

1 4,294,381
529 4,294,382
611 4,294,383

CLASS 224

42.42 4,294,384
240 4,294,385
252 4,294,386
315 4,294,387
4,294,388

CLASS 225

34 4,294,389

CLASS 226

181 4,294,390

CLASS 227

130 4,294,391

CLASS 228

111 4,294,392
134 4,294,393
158 4,294,394
220 4,294,395
245 4,294,396

CLASS 229

15 4,294,398
27 4,294,397
44 CB 4,294,399
68 R 4,294,400

CLASS 234

487 4,295,041

CLASS 235

1 E 4,295,036
92 PD 4,295,037
92 PK 4,295,038
379 Re.30,773
380 4,295,039
458 4,295,040

CLASS 236

1 G 4,294,401
12 R 4,294,402
13 4,294,403
49 4,294,404

CLASS 238

14 4,294,405

CLASS 239

20 4,294,406
102 4,294,407
218.5 4,294,408
577 4,294,409
4,294,410
707 4,294,411

CLASS 241

30 4,294,412
36 4,294,413
222 4,294,414
292 4,294,415

CLASS 242

18 G 4,294,416
149 4,294,417
197 4,294,418

CLASS 244

117 R 4,294,419
165 4,294,420

CLASS 248

37.6 4,294,421
48.2 4,294,422
4,294,423
362 4,294,424
445 4,294,425
561 4,294,426

CLASS 250

226 4,295,042
227 4,295,043
229 4,295,044
255 4,295,045
287 4,295,046
363 S 4,295,047
398 4,295,048
409 4,295,049
479 4,295,050
569 4,295,051

CLASS 251

86 4,294,427
214 4,294,428

CLASS 252

8.6 4,294,708
8.75 4,294,711
8.8 4,294,709
4,294,710
12 4,294,712
28 4,294,713
34 4,294,714
68 4,294,716
97 4,294,717
135 4,294,718
182 4,294,719
373 4,294,720
429 B 4,294,721
435 4,294,722
440 4,294,723
451 4,294,724
455 Z 4,294,725
462 4,294,726
522 R 4,294,727
542 4,294,728
545 4,294,729

CLASS 254

272 4,294,429

CLASS 256

58 4,294,430

CLASS 260

17.4 BB 4,294,730
17.4 CL 4,294,731
22 CB 4,294,734
4,294,735
4,294,748
22 M 4,294,736
27 BB 4,294,732
28.5 B 4,294,733
29.2 EP 4,294,737
29.4 UA 4,294,738
29.6 NR 4,294,741
29.6 RB 4,294,740
29.6 RW 4,294,739
31.8 H 4,294,742
32.8 EP 4,294,743
33.6 AQ 4,294,744
37 EP 4,294,745
4,294,746
37 R 4,294,747
40 P 4,294,749
40 R 4,294,750
42.14 4,294,752
112 R 4,294,753
112.5 R 4,294,754
154 4,294,755
163 4,294,756
239.3 D 4,294,758
239.3 P 4,294,757
326.27 4,294,759
326.47 4,294,760
338 4,294,761
340.3 4,294,762
340.5 DP 4,294,763
340.9 R 4,294,764
343.3 R 4,294,765
343.6 4,294,766
347.8 4,294,767
372 4,294,768
378 4,294,769
400 R 4,294,751
413 4,294,770
4,294,771
429.7 4,294,772
453 P 4,294,773
4,294,774
455 R 4,294,775
502 R 4,294,776
544 D 4,294,777

CLASS 261

30 4,294,778
35 4,294,779
39 B 4,294,780
89 4,294,781

CLASS 264

1.4 4,294,782
8 4,294,783
14 4,294,784
41 4,294,785
46.4 4,294,786
46.6 4,294,787
101 4,294,788
102 4,294,789
171 4,294,790
210.2 4,294,791
311 4,294,792
4,294,793
328.1 4,294,794
332 4,294,795
559 4,294,796

CLASS 266

44 4,294,431
46 4,294,432
161 4,294,433
170 4,294,434
234 4,294,435
257 4,294,436
272 4,294,437
280 4,294,438

CLASS 267

54 A 4,294,439

CLASS 269

71 4,294,440
97 4,294,441
101 4,294,442
108 4,294,443
156 4,294,444

CLASS 272

8 M 4,294,445
133 4,294,446

CLASS 273

58 R 4,294,447
94 4,294,448
126 R 4,294,449
176 F 4,294,450
308 4,294,451
403 4,294,452

CLASS 277

22 4,294,453
65 4,294,454

CLASS 280

11.2 4,294,455
11.28 4,294,456
20 4,294,457
605 4,294,458
4,294,459
607 4,294,460
618 4,294,461
634 4,294,462
646 4,294,463
649 4,294,464
756 4,294,465
772 4,294,466
801 4,294,467
807 4,294,468

CLASS 281

29 4,294,469

CLASS 285

5 4,294,470
24 4,294,471
27 4,294,472
50 4,294,473
133 R 4,294,474
165 4,294,475
189 4,294,476
336 4,294,477

CLASS 293

128 4,294,478

CLASS 294

82 R 4,294,479
131 4,294,480
146 4,294,481

CLASS 295

34 4,294,482

CLASS 296

136 4,294,483
156 4,294,484
166 4,294,485
167 4,294,486
188 4,294,487

CLASS 297

367 4,294,488
452 4,294,489

CLASS 299

67 Re.30,769

CLASS 301

63 DD 4,294,491
63 PW 4,294,490

CLASS 307

10 R 4,295,052
64 4,295,053
80 4,295,054
221 C 4,295,055
4,295,056
231 4,295,057
252 A 4,295,058
253 4,295,059
273 4,295,060
279 4,295,061
4,295,062
362 4,295,063
468 4,295,064
475 4,295,065

CLASS 308

8.2 4,294,492
10 4,294,493
76 4,294,494
174 4,294,495

CLASS 310

30 4,295,066
52 4,295,067
4,295,068
67 R 4,295,069
70 R 4,295,070
213 4,295,071

CLASS 312

208 4,294,496
231 4,294,497
245 4,294,498
334 4,294,499

CLASS 313

7 4,295,072
105 CM 4,295,073
174 4,295,074
220 4,295,075
223 4,295,076
293 4,295,077

CLASS 315

8 4,295,078
130 4,295,079

CLASS 318

257 4,295,080
327 4,295,081
599 4,295,082
696 4,295,083
719 4,295,084
721 4,295,085
4,295,086

CLASS 322

99 4,295,087

CLASS 323

313 4,295,088
351 4,295,089

CLASS 324

60 CD 4,295,090
4,295,091
61 R 4,295,092
77 B 4,295,093
96 4,295,094
326 4,295,095
357 4,295,096
429 4,295,097

CLASS 328

24 4,295,098
151 4,295,099

CLASS 330

257 4,295,100
262 4,295,101

CLASS 331

65 4,295,102
94.5 C 4,295,104
94.5 PE 4,295,103

CLASS 332

9 R 4,295,105
37 R 4,295,106

CLASS 333

25 4,295,107
193 4,295,108
249 4,295,109

CLASS 335

212 4,295,110
256 4,295,111

CLASS 336

84 M 4,295,112
4,295,113

CLASS 337

3 4,295,114

CLASS 338

4 4,295,115
4,295,116
4,295,117
32 H 4,295,118
162 4,295,119

CLASS 339

5 M 4,294,500
66 M 4,294,501
112 L 4,294,502
119 L 4,294,503
132 R 4,294,504
231 4,294,505

CLASS 340

146.3 MA 4,295,120
4,295,121
147 LP 4,295,122
347 AD 4,295,123
347 DD 4,295,124
4,295,125
4,295,126
373 4,295,127
506 4,295,128
520 4,295,129
524 4,295,130
554 4,295,131
562 4,295,132
573 4,295,133
610 4,295,134
734 4,295,135
753 4,295,136
781 4,295,137
785 4,295,138
870.01 4,295,139

CLASS 343

100 PE 4,295,140
753 4,295,141
781 CA 4,295,142
840 4,295,143
895 4,295,144

CLASS 346

108 4,295,145
140 R 4,295,146

CLASS 350

6.8 4,294,506
96.13 4,294,507
96.15 4,294,508
4,294,509
96.17 4,294,510
96.18 4,294,511
96.20 4,294,512
96.29 4,294,513
96.31 4,294,514
174 4,294,515
335 4,294,516
345 4,294,517
357 4,294,518
4,294,519
4,294,520
426 4,294,521

CLASS 351

2 4,294,522

CLASS 352

86 4,294,523

CLASS 353

84 4,294,524

CLASS 354

23 D 4,294,525
25 4,294,526
4,294,527
33 4,294,528
53 4,294,529
173 4,294,530
195 4,294,531
246 4,294,532
318 4,294,533

CLASS 355

3 R 4,294,534
14 C 4,294,536
14 SH 4,294,535
35 4,294,537
51 4,294,538
76 4,294,539
4,294,540

CLASS 356

145 4,294,541
339 4,294,542
375 4,294,543
376 4,294,544
386 4,294,545
399 4,294,546

CLASS 357

5 4,295,147
17 4,295,148
45 4,295,149
54 4,295,150
68 4,295,151
74 4,295,152

CLASS 358

3 4,295,153
4 4,295,154
12 4,295,155
4,295,156
17 4,295,157
4,295,158
22 4,295,159
31 4,295,160
34 4,295,161
128.6 4,295,162
165 4,295,163
166 4,295,164
193.1 4,295,165
243 4,295,166
285 4,295,167

CLASS 360

66 4,295,168
71 4,295,169
73 4,295,170
4,295,171
109 4,295,172
125 4,295,173

CLASS 361

16 4,295,174
69 4,295,175
91 4,295,176
154 4,295,177
220 4,295,178
318 4,294,715
331 4,295,179
383 4,295,180
395 4,295,181
400 4,295,182
403 4,295,183
406 4,295,184

CLASS 362

211 4,295,185
217 4,295,186
352 4,295,187

CLASS 363

21 4,295,188
41 4,295,189
162 4,295,190

CLASS 364

104 4,295,191
200 4,295,192
4,295,193
4,295,194
414 4,295,195
501 4,295,196
510 4,295,197
515 4,295,198
555 4,295,199
4,295,200
561 4,295,201
748 4,295,202
4,295,203
824 4,295,204
900 4,295,205
4,295,206
4,295,207
4,295,208

CLASS 365

178 4,295,209
227 4,295,210

CLASS 366

1 4,294,547
60 4,294,548
164 4,294,549

CLASS 367

4 4,295,211
20 4,295,212
41 4,295,213
140 4,295,214

CLASS 368

196 4,295,215

CLASS 369

55 4,295,216

CLASS 370

81 4,295,217

CLASS 371

40 4,295,218
51 4,295,219
61 4,295,220

CLASS 375

23 4,295,221
106 4,295,222

CLASS 376

363 4,294,661
404 4,294,658
442 4,294,660

CLASS 400

110 4,294,550
119 4,294,551
219.1 4,294,552
4,294,553
320 4,294,554
488 4,294,555
643 4,294,556
714 4,294,557

CLASS 402

75 4,294,558

CLASS 403

28 4,294,559
104 4,294,560
219 4,294,561
383 4,294,562

CLASS 405

132 4,294,563
195 4,294,564

CLASS 407

113 4,294,565
114 4,294,566

CLASS 408

72 R 4,294,567

CLASS 409

244 4,294,568

CLASS 410

133 4,294,569

CLASS 411

103 4,294,570
185 4,294,300
345 4,294,156

CLASS 414

537 4,294,571
641 4,294,572

CLASS 417

83 4,294,573

CLASS 422

36 4,294,797
62 4,294,798
4,294,799
68 4,294,800
98 4,294,801
103 4,294,802
111 4,294,803
112 4,294,804

CLASS 423

4 4,294,805
235 4,294,928
239 4,294,806
242 4,294,807
305 4,294,808
321 R 4,294,809
331 4,294,810
350 4,294,811
357 4,294,812
385 4,294,813
457 4,294,814
478 4,294,815
484 4,294,816

CLASS 424

8 4,294,817
12 4,294,818
14 4,294,819
28 4,294,820
45 4,294,821
49 4,294,894
59 4,294,822
78 4,294,823
101 4,294,824
4,294,825
4,294,826
226 4,294,827
232 4,294,828
241 4,294,829
251 4,294,830
253 4,294,831
258 4,294,832
260 4,294,834
263 4,294,833
4,294,835
4,294,836
4,294,837
4,294,838
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317 4,294,852
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326 4,294,854
358 4,294,855

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99 4,294,857
241 4,294,858
410 4,294,859
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475 4,294,861
502 4,294,862
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549 4,294,864
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109 4,294,868
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451 4,294,888
515 4,294,889
641 4,294,890

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13 4,294,892
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CLASS 501

129 4,294,618

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249 4,294,964
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CLASS 546

242 4,294,967
251 4,294,968
286 4,294,969
294 4,294,970

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320 4,294,973

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482 4,294,975

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CLASS 564

18 4,294,985
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331 4,294,987
417 4,294,988

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855 4,294,997
868 4,294,998
910 4,294,999

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D2—	279	261,195		137	261,216		77	261,240		35	261,261		65	261,285			261,306
	383	261,196		208	261,220		91	261,241			261,262		87	261,286			261,307
	400	261,197	D8—	02	261,221		106	261,242	D14—	2	261,263			261,287			261,308
		261,198		68	261,222		121	261,243		14	261,264		89	261,288			261,309
D3—	7	261,199		312	261,223	D11—	27	261,244		59	261,265		111	261,289			261,310
D6—	85	261,200		323	261,224		75	261,245	D15—	116	261,269		113	261,290			261,311
		261,201		344	261,225			261,246		199	261,270		128	261,291			261,312
	89	261,202		350	261,226			261,247	D16—	31	261,271		143	261,292			261,313
	90	261,203			261,227		121	261,248		32	261,272		151	261,293			261,314
	103	261,204			261,228		128	261,249	D18—	7	261,273		195	261,294			261,315
	122	261,205		396	261,229			261,250			261,274		234	261,295			261,316
	143	261,206	D9—	367	261,230		157	261,251		10	261,275	D22—	5	261,296	D28—	35	261,317
	144	261,207		370	261,231		158	261,252		12	261,276		25	261,297			261,318
	197	261,209			261,232			261,253			261,277		27	261,298			261,319
	234	261,208		398	261,233			261,254		27	261,278			261,299	D32—	21	261,266
	286	261,210		432	261,234		163	261,255	D19—	62	261,279	D23—	35	261,300			261,267
D7—	13	261,211		434	261,235	D12—	146	261,257		76	261,280	D24—	12	261,301		32	261,268
	68	261,212		435	261,236		148	261,256	D20—	38	261,281		26	261,302		49	261,217
	77	261,213	D10—	15	261,237		189	261,258	D21—	24	261,282		38	261,303		73	261,219
	84	261,214		61	261,238	D13—	11	261,259		33	261,283	D25—	74	261,304			
	131	261,215		64	261,239		18	261,260		34	261,284			261,305	D34—	1	261,218

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4,295,197	4,294,635	4,294,594	4,294,004	4,294,381	4,294,193
04 : 4,294,026	4,294,640	4,294,595	4,294,008	4,294,382	4,294,371
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